


A HEALTH PRIMER

COLEMAN

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FOR ELEMENTARY SCHOOLS

BY

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PHYSIOLOGY," "ELEMENTARY PHYSICS," ETC.

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TO THE TEACHER

THIS book is an attempt to aid pupils at the difficult stage of school work where they pass from mere reading books to the study of text-books. It is hoped that the familiar interest of the subject and the simplicity of the language, as well as the method of interweaving the facts of everyday life alternately in story and in lesson form, will enable the transition to be made with little difficulty to teacher and pupil. It is believed, at least, that this subject is more appropriate for introducing the study of text-books than geography, history, language, or other subjects usually introduced at this stage.

The stories should be used not only for supplementary reading, but for exercises in language and expression. Several plans for doing this are suggested to the teacher at the end of some of the earlier stories in the book.

The review questions should be used little at first, but gradually more and more as the pupils acquire the power of study. In this, as in his other text-books, the author has avoided placing a formal set of questions at the end of each lesson. He considers this custom a reprehensible one, and a great encouragement to mechanical learning and quick forgetting. In fact, this plan resembles the old catechisms. The review questions in this book require that the lessons be reviewed after leaving them, and thus they serve to connect one

subject with another. On account of the remarkable facility with which young pupils forget, the same questions should be used again and again.

What the pupils learn, however, is not so important as what they learn to love. The chief object of this book is to encourage love of health and strength, simple living, and respect for the sacredness of natural instincts.

A search for the cause of physical ills of adolescence and adult life reveals the fact that much of this ill health and suffering is the result of ignorant and habitual violation of hygienic laws in early childhood. The author labored for a long time under a misapprehension in regard to the right age for taking up the study of hygiene. Many facts have at last forced upon him the conclusion that childhood and not adolescence is the period of keenest interest for this subject. The mind becomes less receptive and open to the truth when only a few years have passed, and the youth has formed bad habits and acquired the prejudices of his elders against simple, healthful living.

For this or for other reasons young children take more interest than older children in learning about their bodies, and in applying the knowledge gained. This is more surprising when we consider the poor quality of most of the elementary text-books in physiology. The author has taken occasion to examine almost all of them, and finds that several of them are filled with treatises on making beer, wine, and whisky. (These may be the ones referred to in certain schools as the "whisky books.") Other books handle the curse of intemperance very gingerly, as if the authors would indorse a moderate use of alcoholic drinks and have us imitate the foreign

~~temperance societies which meet in wine-rooms and pass their temperance resolutions over bottles of wine and tankards of foaming beer. Another primary book he finds to be devoted chiefly to the inappropriate subject of food adulterations; another is swarming with cells and germs; many of the books are burdened with dry anatomical details.~~

~~There have been left to' many teachers as the only alternatives: to omit the subject and suffer the painful consciousness of not complying fully with the laws, or to employ books not suited for the purpose.~~

Many schools have tried the plan of having one lesson a week and found it unsatisfactory. The suggestion is made that the equivalent of this consisting of daily lessons for eight weeks each year will give far better results. With such a plan this book will supply lessons for two years, besides a considerable course in supplementary reading. If arithmetic or grammar were taught only one day in the week and the lessons consisted chiefly of moralizing instead of science, no intelligent grasp of the subject would ever be gained and no interest would be aroused.

It is hoped that this book is not afflicted with "goody-goodness," which is the bane of most attempts to excite interest in physical as well as moral welfare. The author has taken it for granted that the pupils have minds to think with, and therefore has left the point of each story or incident to be discovered by the pupil. The teacher should test the class to see whether the intended lesson has impressed them, but should refrain from sermonizing as carefully as the author has done.

It has been a pleasure to the author to write this book; for since life and living is the subject which

comes before all others in keen interest to children, he believes that their inquiring minds will carry them to success where he may have failed to do his part, and where both author and pupil fail, the assistance of the teacher will be at hand. The author deems no apology necessary for introducing a number of stories, since their effectiveness in primary teaching has been well proved.

Acknowledgments. — Many of the illustrations have been chosen with the hope of instilling a love for a sound and beautiful body. The half-tone cuts of statuary and bas-relief are taken by permission from the copyright catalogue of the plastic arts, published by Messrs. P. P. Caproni & Bro. of Boston. A selection from James Russell Lowell's "Stanzas on Freedom" is used by permission of Messrs. Houghton, Mifflin and Co., Boston. "The Boy who Laughs" and "The Good Machine" are from the Excelsior Readers, and are used by permission of Messrs. Crane & Co., publishers, Topeka, Kansas. The B. F. Johnson Publishing Co., Richmond, have allowed the use of an extract and of two illustrations from their Primary Book of Physical Culture. The courtesy of the publisher of "Little Folks," S. E. Cassino, Esq., Salem, Mass., makes it possible to include in this volume Figures 1, 40, and 43, which appeared in that magazine. Leonard Semmon, Esq., has kindly loaned several photographs from which illustrations have been made. Several illustrations (Figures 3, 4, and 33) by Dr. Eliza M. Mosher are taken, by permission, from "The Educational Review," Nicholas Murray Butler, Editor.

*The story of Robin in the Wood
and the other tales from the
Hornet, 1890*

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HEALTH PRIMER

I.—LEARNING HOW TO KEEP SOUND AND STRONG



WHAT are the parts of your body? You say, "My head and chest, my arms and legs." There are other parts that are in some ways more wonderful and need more care than the parts you name. The heart, the lungs, the brain, are wonderful parts of the body. It is time for you to study about the body and learn how to take the best care of it.

You will have better health all your lives if you begin while boys and girls to learn a few important things about your bodies. It is wrong to be ill if a little study and care will prevent illness. When we are ill, we make trouble and expense for those at home, and cause them to use much labor and time in caring for us. When

we are very ill, we cannot lift the head from the pillow, and we lie restless in bed for days or weeks. Illness makes the strongest arm weak. It makes the fairest day seem dreary.

How is it with people who do not learn when they are children to take care of their bodies and their health? They sometimes lose their health by the time they are grown, and have to live with broken-down bodies all the rest of their lives.

Your teacher wishes to help you learn how to grow up to be sound, well-shaped, strong men and women. You may believe that to do this takes some care and knowledge while you are young; for a perfectly healthy and perfectly shaped man or woman is not often found.

Sometimes a person is not to blame for being ill. A mother may lose her health in taking care of a sick child during a serious illness. Even then it is her duty to take as little risk as possible, for if she loses her health, she can take care of her children no longer. A man may be reckless and break his leg. He is to be blamed; but

the soldier who loses a leg in fighting for his country deserves praise and pity.

We should try, then, to keep well and strong. We need every part of our bodies. You would miss even your little finger if it should be taken away. To-morrow you may read the story about Robbie in No-Hand Land.

After nearly every lesson will be found a story to show the use of the lesson and make its meaning clearer. Many of the stories are true in every word. Some of them are only partly true. Several of the stories are only fairy stories, or fables; but if you study the other stories and the lessons well, your teacher will let you read also the stories which are "sure enough" stories; that is, they never happened at all.

ROBBIE IN NO-HAND LAND

1. When the first bell rang for dinner, Robbie's mother said, "Hurry, my boy, and wash your hands and clean your finger nails before dinner is ready." Robbie's finger nails were often so dirty that his

mother was ashamed to have him come to the table.

2. Robbie was usually a good child. But to-day he spoke in a cross tone to his mother and said, "I wish I didn't have any hands." As he knew he could not go to the table with hands so dirty, he ran out to the barn and threw himself on the soft hay.

3. He lay there still and quiet. In a few minutes the queerest little man came up and spoke to him. "You are in No-Hand Land, now, so I must take off your hands." "No, you mustn't," said Robbie, very much scared.

4. "Don't you see you are in No-Hand Land, now?" asked the queer little man. "This is the place where all the people live who wish they had no hands. Many people come here because they do not want to work; and some little boys come because they do not want to have their hands washed. Yours will not have to be washed any more," said the little man, "so just stand up and let me take them off."

5. Then the little old man unfastened Robbie's hands and took them off, and told him to go out into the next field. He went out there and found some other



FIG. 1. — ROBBIE IN THE BARN.

little No-Hand children to play with. The No-Hand boys could not play ball or marbles or tops, but only some simple games like "tag" and "puss-wants-a-corner."

6. Soon the bell rang for dinner. The

boys did not have to get ready, but rushed in to the table. Robbie was very hungry, for he had eaten no dinner that day. But he did not know how to begin to eat without any hands, and there was nobody else with any hands to help him, so he lay down on the floor and began to sob. He said to himself, "Oh, if I just had my hands back, I would keep them washed and keep my finger nails neat all the time!"

7. Soon the bell rang again, louder this time, and some one was calling "Robbie!" He opened his eyes. There were the rafters of the barn above him, and the pile of hay was beneath him. He was almost afraid to look for his hands, but he pulled them out from under his head, and sure enough, there they were.

Be ready to tell the story to the teacher and the class, if your teacher should call upon you to do so





II.—HOW THE BODY TAKES CARE OF ITSELF

You learned in the first lesson that we keep well when we use the body properly, and that we become ill because we have done some wrong to it. Yet we often get only a little punishment for not taking care of the body, as the body has many ways of taking care of itself.

For example, you should not live in a dusty room, but if you do so, the hairs in the nose catch some of the dust and keep it from going to the lungs. If you cut your hand, the blood quickly dries and hardens over the cut and stops the bleeding. If you tear your clothes, they have to be mended. Even if you cut yourself deep, the flesh and skin soon grow again and make the place as sound as it was before.

If you break a tooth, it does not mend itself, but if you break a bone, it soon grows to be as firm and strong as ever.

If you get a cinder into the eye, the tears come and try to wash away the cinder. If you put your hand on a stove that you did not know was hot, the arm gives a quick jerk before you know it, to save the hand from being burned.

People who do not live properly often have headaches or other aches and pains. The body is warning them to live better. If a man's blood becomes so impure that the body cannot be strong and well, a fever comes to burn up the impure part of the blood. The fever makes the blood pure, and before long the man feels well and strong again.



III.—THE SIGHT



WE have five ways of learning about the world around us. We can see, hear, taste, 'smell, and touch. These five ways are called the "five senses."

The eyes are said to be like windows, because through them we look out on the world. The lids are like the shutters before a window. Nature takes care of the eyes in many ways. The eyeballs lie in a hollow in the bone, on a soft bed of fat. The eyebrows keep the sweat on the forehead from running into the eyes. The eyelids and the eyelashes protect the eyes from dust and from too strong light. Tears wash the eyes and keep the eyeballs clean. The bony brow, the nose, and the cheek bone stand out to the front and protect the eyes from blows.

The eye is very delicate. Even a small cinder in the eye causes great pain.

Look at the eye of a schoolmate. In the middle of the eye will be seen a round black spot called the "pupil." It is only a hole in the colored curtain called the "iris" that is in the front part of the eyeball. Light passes into the eye through the pupil. The curtain draws together when the light is bright, because then all the light that is needed can go in through a small opening. When the light is dim, the pupil becomes large and lets in more light. Did you ever see the pupil of a cat's eye? When you go home, notice what a long, narrow slit it is. But if you cover the eye for a moment, or let the cat go under the bed, where it is darker, the pupil becomes very large. At night the cat needs all the light it can get, to see whether there are any mice around.

Some children are near-sighted. They should be very careful with their eyes, and should not strain them by reading fine print or use them in a dim light.

The brain is in the head. It is the part of the body with which we think. Tiny white threads called nerves go from the brain to the eye. When the light goes

into the eyeball, it reaches some of the tiny white threads, which take the news to the brain. So we see with the brain and the eye together.

Some persons are color blind. They cannot tell all the colors apart. Red and green look the same to them.

THE SLING SHOOTER

1. Arthur Hopkins had a sling shooter, or bean shooter. He shot pebbles placed in the leather piece.

2. He boasted to the other boys about how straight he could shoot. Yet the boys noticed that he seldom hit anything he shot at. Most of the boys concluded that the shooter was a very poor thing, but Sam White, Arthur's best friend, made one.

3. Sam and Arthur were playing by a long house one day, when Sam suddenly threw his hands up to his eye and began to groan. Arthur had shot him in the eye. He was in great pain, and Arthur's face turned almost as white as a sheet. Sam was taken home. The pain in his eye was

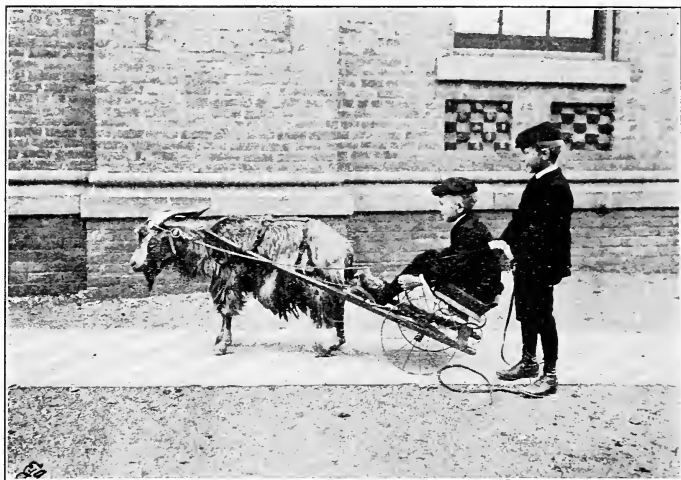


FIG. 2.—SAM AND ARTHUR.

dreadful. The ball of the eye was swollen and red with blood. Sam could not bear the light, so he was kept in a dark room for many weeks.

4. The doctor came and cut into the eye and did all he could to cure it, but in vain. Sam¹ became blind in that eye. The other eye was weak for a while, and his parents feared he would be blind in both eyes. Sam was a brave boy, but he gave up hope while in the dark room, and cried for hours, saying "I'm blind!

¹ A cousin of the writer of this book.

I'm blind! I shall never see anything again."

5. Finally the other eye got well, but he is blind in one eye. He cannot judge very well how far off anything is, for it takes two eyes to do that. He can hardly play base ball, for he is apt to shut his hands before the ball gets to him, and let it strike the ends of his fingers.

Arthur was very sad whenever he thought of what he had done.

Write this story from memory, using the following outline:— Arthur's bean shooter. What he used it for. Sam and Arthur playing. The accident. The doctor. The blind eye.



IV.—TAKING CARE OF THE EYES



ONCE a boy said to his playmates, "I am not afraid to look straight at the sun." Then he foolishly began to look at the sun. He felt a sharp pain, but he was a silly boy, and he kept on looking at the sun. He made himself nearly blind by his foolish act. Many a

person has had an eye put out by a stick, a chip, or even a crust of bread carelessly thrown. When using a pocket-knife you should *always* cut *from* you, as boys have lost their eyes by the knife slipping when cutting toward the eyes.

If anything gets under the eyelid, we should not try to get it out by rubbing the eye. If we hold the lids still, with the eyes half closed, the tears may wash it out. If they do not, the lid should be carefully raised and the dust wiped out with the corner of a soft handkerchief.

Facing a bright light for a long time makes the eyes and the head ache. When you read or work, the light should be at one side or behind you. If there is a window behind the teacher's desk, it should be



FIG. 3.



FIG. 4.

closed entirely, or covered by a dark curtain, so that the pupils may not face the light. The light should be steady. Reading in a dim light harms the eyes.

After you have read or sewed for a long time the eyes may begin to smart and the sight become dim. This is a hint for you to stop at once and rest them.

You should never read books that are printed in very small type.

If you do not keep your eyes at least twelve inches from your book, you may become near-sighted. (See Fig. 3.)

Tobacco sometimes causes dimness of sight.

Write on a sloping desk, not on a flat desk. (See Fig. 4.) If you cannot see your work well, tell your teacher.

Do not use a towel that has been used by any one with sore eyes.

The light should not fall on the eyes but on the book.

Bright sunlight should not shine on the book.



V.—THE HEARING

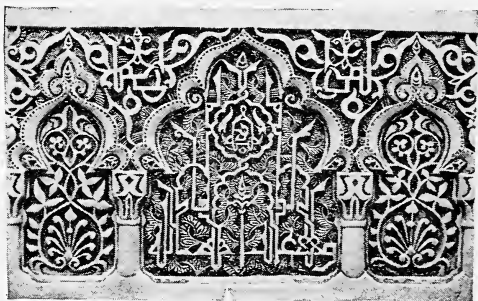


WHAT you see of the ear is only a piece of gristle covered with skin. It is shaped so as to catch the sound as it comes through the air and turn it into the little tube which leads to the true ear. When you beat a tin pan or ring a bell, the air is started to moving in waves. The waves strike against a little drum skin across the inner end of the tube of the ear. Three little bones then carry the waves to the nerves farther in the ear.

The drum skin is very thin, but it is so deep in the head that it is not easily broken. A careless child sometimes puts a pen or pencil into the ear, or picks the ear with a pin. This is not safe. There is also danger of hurting the drum skin by slapping the ear or by screaming into it.

Some people foolishly take quinine for every little ill. Quinine has injured the hearing of many people.

Wax is formed in the ear tube. It keeps flies and bugs from going into the ear; it also catches dirt and dust. The wax dries when it is old and falls out in thin, white flakes. In this way the tube of the ear is kept clean. The part of the ear that is gristle should often be washed, for it cannot keep itself clean.





VI.—REVIEW

EXPLAIN why children should learn while young to take care of their bodies. Tell a story that shows how useful the hands are. What is the use of hairs in the nose? Tell six ways in which the body takes care of itself. What are headaches for? How may a fever do good?

How is the eye placed to keep it from harm? What is the use of the eyebrows, tears, eyelids, eyelashes? What are the iris and the pupil of the eye? Why does the pupil change in size? Why are nerves needed in seeing? What two colors look the same to color-blind people?

Tell several ways in which the sight has been lost by carelessness. What should be done if a cinder gets into the eye? Give the rules for care of the sight.

What is the use of the outer ear? How may the drum skin of the ear be broken? How is the tube of the ear kept clean?



VII.—WHAT HAPPENS TO THE UNGRATEFUL

THERE is no part of the body that is useless. Every part has its duty to perform. Suppose your father gave you a knife and you laid it on a shelf and did not use it; suppose you did not even keep the dust and rust off. Do you not think it would be right for him to take the knife away and give it to your brother who would make good use of it and keep it clean and bright?

The hair is given us to protect the head from cold and to keep off the hot rays of the sun. Some boys wear fur caps so thick that their hair is useless. Some men even seem to think the hair is of no use. They wear hats everywhere. They wear hats that are as hard as wood and fit so tight that neither air nor fresh blood can get to the scalp. These people are not thankful for their hair, but act as if they think it is of no use whatever. So the hair,

on the part of the head covered by the hat, is taken away from them.

Some children will not eat anything hard. They do not like hard crusts of bread, or tough bread made without lard. You would almost think they had false teeth and were afraid of breaking them by eating anything hard or tough. Gums would do as well as teeth for the food they eat. They do not use their teeth. So the teeth decay and are taken away from them.

We have natural feelings, called instincts, to protect us from harm, and lead us in the best way. Thirst is the instinct which tells us when we need water. The lower animals have more instincts than man. You cannot drive a little pig into a fire, even if it never saw a fire before; but a little baby will put its hands into a flame. Man has more instincts than he uses or seems to be thankful for. No one ever heard of a baby with an instinct to drink beer or brandy. Can you find a young child that enjoys the taste of tobacco or the smell of a pipe or cigar? Tongue, nose, and

stomach all turn us against these things. Instinct would protect us from these poisons, but some people care nothing for the good gift of instinct. They pay no attention to the warning against poisons, but keep on taking them ; so just as people lose hair and teeth and strength of muscles by not using them, so such people lose their instincts.





VIII.—TASTE, SMELL, AND TOUCH



WE taste with the tongue and the lining of the mouth. The sense of taste tells us whether food is good or bad, fresh or spoiled. It helps us to tell food from poison if we only give heed to it. Our taste tells us that tobacco is bitter, and instinct warns us against it. If we do not heed the sense of taste, but go on as if it did not warn us, this sense will soon cease to do so. It warns us against alcohol also, which has a burning taste. Men mix water and sugar and other things with alcohol, so as to cheat or fool the taste. They do not trust this faithful friend, and soon the friend ceases to warn them.

The sense of **smell**, like the sense of taste, helps us to select proper food. It warns us not to eat that which is spoiled and unfit

to be eaten. Besides that, it warns us not to breathe bad air. Air, or any other gas, with a bad odor, is usually a danger to health and life.

Some animals have a much keener sense of smell than man. A dog can smell the track of a wild animal hours after the animal has passed. This sense is apt to be injured if a person has many bad colds. Savages can smell much better than men who live in houses; for savages do not often have colds.

If we never abuse the senses of taste and smell by forcing them to bear unwelcome things, they do not become dull, but are true friends. The odor of flowers gives us nearly as much pleasure as their beauty; but tobacco usually has a very strong and unpleasant odor and a biting taste.

We should not eat unless we are hungry and the food tastes good.

The sense of **touch** does not have a special place in the body like the other senses you have studied. This sense is in the skin over the whole body. Yet it is keenest in the tips of the fingers, on the

face, and in the tip of the tongue. It tells us whether things are rough or smooth, hard or soft. It tells us much else besides. Have you ever seen a blind man read raised letters by the sense of touch? By feeling one's face, a blind person knows it again as well as others do by seeing it.

A GOOD MACHINE

1. "What is that?" said Uncle Phil. He was walking along the garden path, when Felix came rushing up on his new bicycle. Uncle Phil made a jump to one side, as if in great fear of being run over; but the small boy proudly showed his skill by stopping just before his uncle. "You needn't get out of the way for me, Uncle Phil. I can stop in a minute, you see."

2. "I see you can," said he, smiling at the air with which the little man sprang from his steed, and now stood rubbing some dust from his shining wheel. "He's a fine horse, isn't he, and he never needs feeding."

3. "No," said Felix; "but, Uncle Phil, I'll tell you — though I wouldn't tell papa for anything, — if there was one thing I wanted more than a bicycle, it was a box of tools."

4. "But you're rather too small for a tool chest yet, Felix, it seems to me."

"That's what mamma says," said Felix; "I talked to her about wanting one, but she thinks I'd cut myself with the knives, and saw my toes off with the saw, and do something else with something else. But I'm getting old enough to look out for myself."

5. "Why are you so anxious for tools?"

"Oh, there are lots of things I want to do. I want to make a kennel for Carlo, and a coop for the little chickens, and some frames for Aunt Mary's plants, and a thing for Jane to wind her clothesline on, and a box for the kindling, and — oh, ever so many other things."

6. "I hope you will get a set some day," said Uncle Phil. "I knew a boy once who had a grand set of tools."

"How old was the boy?"

“Well, he was younger than you are.”

“Ho!” said Phil, longingly. “Was it full of all sorts of tools? Was there a saw and a hatchet, and other things?”

7. “Well, this was really more like one complete machine made up of parts which could be put to a great many uses. Indeed, I don’t know of a single thing which could not be done with one or another of its parts, if the proper use were made of them.”

8. “I’d like to see it! Tell me some more about it, Uncle Phil.”

“This machine was so arranged that it could take its owner over the ground much more easily than even your bicycle can. You have to keep on smooth ground with that, but with this machine any boy could go over any kind of rough places, leap over high things, or make the most sudden turns and twists.

9. “There was one part of the machine which showed its owner the exact shape and color of anything near him, and there was one part which caused all the other parts to move and directed them what to do.”

10. "Was the machine wound up with a key?" asked Felix.

"Not exactly with any key such as you have seen. But it had to be wound up every day with things ordered for it. At the very center of its power was something which kept up a constant ticking."

11. "Just like a watch?"

"Yes; but if the ticking once stopped, there was an end to the whole thing—it never could be set going again."

"Well," said Felix, with a sober look, "if I had such a machine I'd take good care of it, I know."

12. "You would think any one would do so. But many people treat these wonderful machines as if they did not value them at all, so that, while they would do good work for seventy or eighty years if well cared for, they are worn out or useless in a third or a half of that time. Some work them without proper times for rest until they wear out. Some, instead of giving the machines the proper things to keep them going, pour into them a number of

things which the owners know will injure and in time will destroy them."

13. "They must be crazy," said Felix. "Why, when papa shows me the wheels of his watch, he makes me shut my mouth tight so that I may not breathe on them. He says the breath would cause rust."

14. "Just so. It is a dreadful thing to put into the most beautiful of all machines what will be sure to rust and dim and dull its perfection."

"Uncle Phil, did you ever see one of them?"

"Yes," said Uncle Phil, taking the boy's hand, as in his eagerness Felix pressed closer to him, "I see one now."

15. "You might go a long way, my boy, before you would find anything to get you over the ground more easily than those active feet, or a tool which could be put to so many uses as this small hand. Your brain does its good part in directing the hands and feet, and your heart will keep the whole machine running for a long time — if you treat your body well."



IX.—THE PARTS OF THE BODY AND WHAT IS DONE BY EACH

THE body has many parts, and each part has its own work to do. There are the hard, stiff bones which hold the body up and keep it in shape. There are the muscles which shorten at times and move the bones to which they are fastened. You have seen the muscle in a piece of beef; it is only lean meat.

But the muscles and other parts would wear out, since they are so often used, if it were not for the red blood which flows through tubes and is all the time bringing something new to build them up again.

But what makes the blood flow to the muscles? There is a kind of hollow muscle, called the heart, which squeezes together, or beats, as we say, and forces the blood along the blood tubes and to all the bones and muscles. Since the blood is always giving up something to the parts of

the body, it must get a new supply. This supply comes from the food we eat and the air we breathe. So we take in air through the lungs and food through the stomach. The air goes to the lungs through the nose and the windpipe. The food goes to the stomach through the mouth and the "swallow," or gullet.

The body is a wonderful machine in which a kind of burning is going on all the time. This burning keeps the body warm, and makes it able to move and think and act. Every fire needs air as well as something to burn. It is for this reason that we must breathe air as well as eat food. The burning of the food by the air keeps the body alive.

The brain is the part with which we think. It sends signals along the nerves to the muscles, glands, and other parts, and puts each part to work when its work is needed.

Did you ever learn about the house that Jack built? You will read a little story in the next lesson about a house more wonderful than the house that Jack built. If you

learn it by heart, you will know the uses of many parts of the body and how those parts all work together.

THE FINGER THAT POINTED

1. This is the finger that pointed.

2. This is the bone that lifted the finger that pointed.

3. This is the muscle that moved the bone that lifted the finger that pointed.

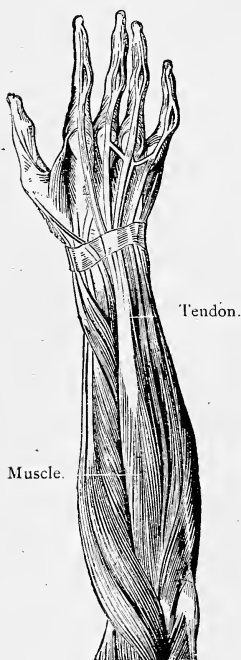


FIG. 5.



FIG. 6.

4. This is the food that burned in the muscle that moved the bone that lifted the finger that pointed.

5. This is the blood that brought the food that burned in the muscle that moved the bone that lifted the finger that pointed.

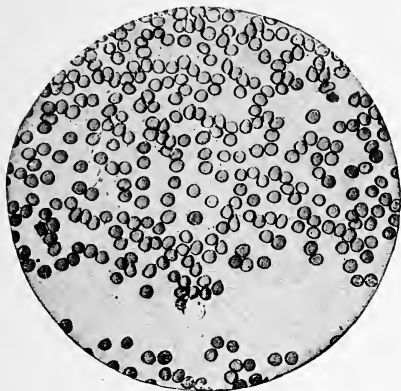


FIG. 7.— BLOOD CORPUSCLES.

that lifted the finger that pointed.

7. This is the brain



FIG. 9.— THE BRAIN.

6. This is the heart that sent the blood that brought the food that burned in the muscle that moved the bone



FIG. 8.— THE HEART.

that rules the body
that holds the heart

that sent the blood that brought the food
that burned in the muscle that moved the
bone that lifted the finger that pointed.



X. — REVIEW

WHAT causes baldness? What is the best way to keep the teeth sound? Name an instinct that protects us. How are instincts lost? Why are water and sugar mixed with alcohol before it is drunk?

What is the use of the sense of smell? Why do savages have a keen sense of smell? Where is the sense of touch keenest? What are instincts?

What is the use of each of these parts of the body: the bones, the muscles, the blood, the heart, the lungs, the stomach, and the brain? What two things are needed for the kind of burning that is going on in the body? Repeat the lines about the finger that pointed.

Why is tough bread good for the teeth? How may we injure them if we try to crack nuts or to chew rock candy with them?

If a man began to get bald would it be better for him to wash his hair with drugs or to wear his hat as little as possible?



XI.—THE BRAIN

You have learned that the brain is the part of the body with which we think. By using the brain you may remember the things you learn in this lesson. The brain is made of soft, gray matter, and is in a bony case called the skull. The skull is very hard, as you can find out by feeling your head. It is very well that the brain is in so strong a box as this. Think how many hard knocks fall upon the skull through life. If one of those knocks fell upon the brain, a man would be killed; but within the skull the brain is quite safe.

Although the brain is hidden away so safely, it has a way of learning about what happens outside the skull. It does this by means of millions of tiny white fibers or threads, called nerve fibers, which connect the brain with the skin and all other parts of the body. Each nerve thread or fiber is smaller than a spider's thread; it is too small to be seen. But the nerve threads

that go to the same parts of the body are bound together in bundles, and form nerves. These are large enough to be seen. The nerve of sight is a bundle made of many fibers ; so is the nerve of hearing, the nerve of smell, etc. The brain uses the nerves to tell other parts of the body what to do. It tells muscles to move the arms and legs ; it tells the heart to beat ; it tells the glands to form fluids when we eat. The parts of the body also send messages to the brain. When a muscle is tired, it tells the brain. When anything is touching the skin, the skin lets the brain know and tells it whether the thing is rough or smooth, hot or cold. The eyes tell of sight, the ears tell of sounds, the nose of odors, the mouth of taste, the skin of feeling.

When it is said that the brain tells the muscle, and the muscle tells the brain, we do not mean that they send words to each other. We mean only that they send signals or signs to each other. Sometimes we compare the brain to the central office to which all the telephone wires run.

The brain not only receives messages,

but thinks about them. The front part of the brain probably does most of our thinking. The dog has a flat forehead, and cannot think well. But the rest of its brain is large and it can see and smell and move as well as a man. Boys and girls should study and think, as well as look and listen. But if they see and hear properly, they will be apt to think properly. People who use their five senses well and think as they should about the messages which the senses bring, are said to have good sense.

THE TOBACCO WORM AND THE MAN



1. One day a large green worm, with a horn on his head and hairs on his back, and ugly, sickly-looking eyes, lay on one side of a big tobacco plant; a man stood on the other side. Would you like to hear what the worm said to the man? It was something like this:—

2. "Why do you take the food that

nature has provided for me to live on? Horses will not eat tobacco; cows will not eat it; chickens will not eat it; turkeys will not touch it; guineas fly from it; rabbits and squirrels do not go near it; even pigs will not touch it; and yet here comes a great big, two-legged man, who has a chance to eat all the fruits and grains, and good things in the world, and takes away the only food that I, a poor green worm, have to live on. A man catches me by the back of the neck and squeezes the life out of me, in order that he may fill himself with what is food for me and poison for him."

3. Tobacco is good to smoke sick chickens with in order to kill little worms in their throats. It is good to wash sheep with in order to kill the ticks on them.. It is good to take the backbone right out of a boy and make him a useless, flabby thing, instead of what God intended that he should be.¹

Let the pupils close their books and write this story in their own language.

¹ From "Physical Culture," copyright 1900. B. F. Johnson Publishing Company, Richmond, Virginia.



XII.—THE BRAIN AND THE SPINAL CORD

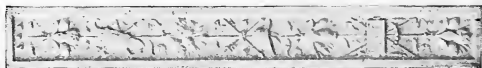
SOME of the nerves, as those of sight and smell, come out from the skull each by itself. But most of the nerves come out in one great nerve called the *spinal cord*. The spinal cord goes down through the backbone and sends out a pair of nerves between each two of the little bones that make up the backbone. The spinal cord is about as large round as the little finger. The brain, spinal cord, and nerves together are called the *nervous system*.

There is not only the big central office of the nervous system in the brain, but there are some little offices all along the spinal cord. In these places the spinal cord takes messages and sends back answers without consulting the brain. Thus, if your hand hangs at your side, and somebody behind you touches it with a pin, the hand is jerked away before the brain knows it.

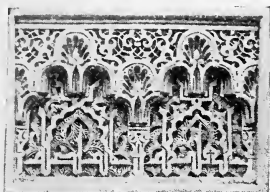
Every feeling, every thought, leaves some effect on the nervous system; that is, it changes the system in some way. We may not be able to bring back the thought when we want to do so, but it may come back some day. Every hasty word and evil deed tends to come back and make us bad again. Every good word and good deed leaves its effect and makes us better.

Do you not know that the arms are made strong by much use? This is also true of the brain. The child who works hard with his brain makes it stronger.

Does a dog have nerves? How do you know? Why should we be kind to all animals?



XIII.—A TRUE FRIEND



“OH, how my hand hurts!” said a small boy who had burned his hand on a hot stove.

His mother said, “You have hurt the nerves in your finger and they give you pain.”

“Oh! those bad nerves,” cried the boy.

The mother replied, “My boy, you are wrong. Nerves are very useful things. If it had not been for the nerves, your finger might have been burned off. As it was, the hand was jerked away by your muscles quicker than you could wink your eye. The nerves caused the muscles to do this. Pain is a friend that says to you, ‘Take care, little man, and do not burn your fingers again.’”

The boy said, “I shall see that I do not touch a hot stove again.”

Not every one learns the lesson of pain so quickly. Many people have headaches

and take deadening drugs to quiet the pain. They will not listen to Pain, which is only a good friend trying to tell them: "You have been acting foolishly. Find out what you did that was foolish, and change, or you will have trouble again." Such persons may have been eating too much. They overeat again and have other headaches. They take another drug for the headaches. Before long, they have ruined their health. They would not have done this if they had taken heed as to what the pain meant. Headaches may be caused by eating too much, or by living in a close room, or by using the eyes too long, or by never using the muscles in working.

When you wear tight shoes, Pain tells you to stop. Some do not stop, and so they get crooked toes and corns and ingrown nails. (See Figs. 10 and 11.)

A man may have a stomach-ache after dinner; so he smokes a cigar and thinks it has helped him. The stomach is in just as bad a state as before, but the poison in the tobacco has deadened the nerves, so that the man cannot learn the truth.

Wise people try to find out the cause of pain, and then try to remove the cause. Children should not have headaches. A headache is a warning that something is wrong, and that a change must be made, or there is danger of a long illness.



FIG. 10.—FOOT WITH CORNS.

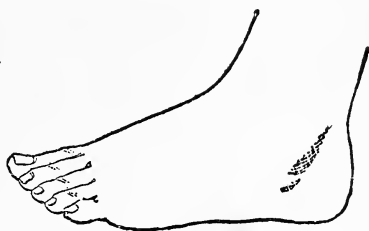


FIG. 11.—A PERFECT FOOT.

WEALTH AND HEALTH

1. An old man saw a youth working hard day and night to make much money. The old man said: "My son, take heed. Those who care too much for money are overcome with greed."

2. But the young man said: "I shall not be overcome with greed. I do not love money for its own sake. I do not love to pile it up and look at it as a

miser does. I love money only for the many things it buys, and for the power it gives."

3. The old man said: "What can money buy? It cannot buy health, but it may break down the health by causing you to eat without hunger, to ride and never walk, to tire the brain without tiring the muscles. It cannot buy love, but it can get you a wife that loves your money and not you. It cannot buy a noble heart, but it may make you hard-hearted and selfish.

4. "It cannot buy friends, but it can buy hypocrites who will cling close to you while you have money, and who will leave you when it is gone. Money cannot buy a kind heart, but it can buy pride that will make you ashamed of the friends of your youth, if they are poor and humble.

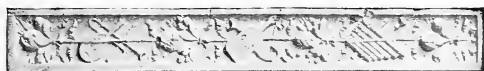
5. "Money cannot buy a happy home, but it will take so much of your time and thought, that you will spend little time with your wife and children. It cannot buy sleep, but the care of it may rob you of your sleep. It cannot buy respect, but it may bring slanders about your hardness

of heart, and it will bring envy of your success.

6. "It will buy bread and clothes and shelter, but the best things in life it cannot buy."

7. So the old man said, "Earn money that you may not come to want or need to borrow, but seek not to possess much money, lest your money possess you."

Tell three ways in which wealth may cause the loss of health. How may it cause sleeplessness? How may worry and unhappiness injure the health?





XIV.—CARE OF THE BRAIN AND NERVES

THE nervous system helps every part of our bodies to act at the proper time. When you take food, the nerves cause the saliva to flow. If a speck of dust gets into the eye, the nerves cause tears to come and wash it away. If a snake crosses your path, you jump back. Since the nervous system is so great a help to us, we should take the best of care of it.

Studying in a close room makes the brain dull from want of pure air. If you sleep in a close room, the brain will not be clear and strong when you awake.

If you do no work with the brain, it will not grow strong. If you do not rest the brain by plenty of sleep, it will not be healthy and strong. If a person gets plenty of sound sleep, he cannot injure his brain by hard work. But if he worries instead of working, his brain soon wears itself out. By making the proper effort, we can keep

from worry so long as the rest of the body is sound and strong. We should not allow our feelings to rule our thoughts. Some persons have so little control over themselves that they jump at slight noises, and are afraid of bugs or mice.

Many people do not work enough with their muscles to become hungry, yet they eat too much food, or eat things that are not good for them. Doing this is apt to make them cross or stupid. They blame others for their own mistakes, and think the world is going wrong because they are not well.

People who sleep soundly and keep their stomachs in good order are less likely than others to worry or to show bad temper. Giving way to bad temper weakens the nervous system.

Children need ten or twelve hours' sleep, because their bodies are growing so fast.

DISCONTENT

1. In winter a mule wished for spring. "The stable is so cold and this straw is so coarse and dry," said the mule. "How I

wish for the grass of spring! It will be so green and tender."

2. When spring came, there was the ground to plow and the grain to sow. The busy mule had little time to enjoy the green grass. He quickly grew as tired of the spring as he had been of the winter; he wished for summer.

3. With summer came the harvest time. The mule had to carry grain to the mill and market. He had to work from early morn till late at night. "Ah!" said he, "this is too bad. I can hardly wait until autumn."

4. But in autumn he found himself in the greatest trouble of all, at least so thought the mule. "My back will break," he sighed, "with all this wood to carry. How I wish for winter; it is the best season of the year. A crib full of bright, golden straw. It makes my mouth water to think of it."

— Adapted from ÆSOP.

THE BOY WHO LAUGHS

1. I know a funny little boy,
The happiest ever born ;
His face is like a beam of joy,
Although his clothes are torn.
2. I saw him tumble on his nose,
And waited for a groan ;
But how he laughed ! Do you suppose
He struck his funny bone ?
3. There's sunshine in each word he speaks,
His laugh is something grand ;
Its ripples overrun his cheeks.
Like waves on snowy sand.
4. He laughs the moment he awakes,
And till the day is done ;
The schoolroom for a joke he takes,
His lessons are but fun.
5. No matter how the day may go,
You cannot make him cry ;
He's worth a dozen boys I know,
Who pout, and mope, and sigh.



XV.—FALSE FRIENDS

SOME people, when they feel ill, or get into trouble, do what is worse than worrying. They deaden their feelings with alcohol or tobacco. Although doing so may bring peace or forgetfulness for a short time, the habit injures the delicate brain and nerves more than anything else they could do. If a person has a spell of "the blues" and it will not go away, good sense requires that he bear it until the spell is over. Suppose something has gone wrong and a person is very much worried. If he cannot be brave enough to stop thinking of it and to make the best of a bad case, then the next bravest thing to do is to face the trouble, even if he has to worry about it. Certainly the most senseless and cowardly thing of all is to take wine or beer or brandy or whisky or opium in order to make the mind stupid.

The ostrich is a large bird that lives in Africa. It runs very fast and the hunters chase it on horseback. People have said that when the hunter is following the ostrich, the bird hides its head in the sand and thinks that, since it cannot see the hunter, the hunter cannot see it. But this is not true; there is no bird in the world so foolish as to act so. Yet a man who makes himself drunk with wine or whisky because he is in trouble, acts very much as the ostrich was once said to act.

A person with very sensitive nerves often has a brighter mind than those with duller nerves. Yet it is the sensitive nerves that are most injured by tobacco and alcohol. A boy may say, "I will smoke cigarettes; they *can't hurt me*." If his nerves are very dull, they will not be hurt so much as if he were a bright boy. But the boy *does not know*. Cigarettes hurt every one that uses them.

There is nothing in beer and wine that can give real strength. Then why do so many people think there is? It is because

alcohol puts the nerves to sleep so that they cannot tell the mind how hard the work is, how heavy the weight is, or how tired the muscles are.

The newspapers tell us every day about people setting houses on fire, about men who lie down half asleep on the railroad tracks and are killed by the cars, about men who get into foolish quarrels and are killed, about men who forget to turn the switches, so that trains are thrown off the track and many people are killed, or crippled for life. Very often the story ends thus, "The man had been drinking."

Alcohol is the poison that is in liquors, such as wine, beer, and whisky. When the brain has been abused by the use of alcohol for a long time, the drinker may become insane. Those who drink much alcohol every day without getting drunk break down their health more than those who get drunk now and then but drink nothing part of the time. The man that is on a spree is not in his right mind for the time. He is often as crazy for the time as an insane person. He does

not care for his family, and often injures them.

When you see a drunkard in the gutter, do not laugh at him and say you could never be like him. He once said the same thing and was not afraid to drink. There are many drunkards in the gutter to-day who no doubt once had as bright minds as can be found. Never take the first drink. Take care of your brain and nerves.

Alcohol causes more suffering and sorrow than almost anything else.

A MAN AND A THING

A friend of mine threw away his tobacco, saying, "That's the end of it." But it was only the beginning. He suffered intensely, and purchased another plug; but God's spirit came to his aid, and as he held the plug in his hand, he said: "I love you, but are you my master or am I yours? You are a weed, I am A MAN. You are a thing, I am A MAN. I'll master you if I die for it. It shall never be said of me again, 'There goes a man mastered by a

thing.'” When the craving came upon him, he would take out the old plug and defy it. The glory of the victory repaid him for the struggle. — JOHN B. GOUGH (pronounced göff).

The son of the Mayor of D—— smoked cigarettes. This made him so nervous and weak that his parents became distressed. His father promised him a pony if he would not smoke until his next birthday. He did not smoke, and the pony was given him. In a few weeks he began to smoke again. His father offered him a gold watch if he would not smoke for a year. He did not smoke and got the watch. But he soon began again. His father obtained a place for him in a large store where every clerk found smoking was discharged. The boy's pride helped him to stop at last.





XVI.—REVIEW

How is the brain kept from harm? What are nerve fibers and nerves? What is the use of nerves? Why is a dog's head flat in front and large behind?

How may tobacco be useful?

How do most of the nerves come out of the skull? What is the nervous system? How large is the spinal cord? When does the spinal cord send back messages without consulting the brain? (See Lessons II and XII.) Does every act and thought change the brain in some way? How may we cause our brains to grow strong?

Show how pain is useful. How does failure to heed pain cause some persons to lose their health? How does failure to heed pain lead to injury to the feet?

Tell several things that the nervous system helps in doing. Name five ways in which the nervous system may be injured.

What is the best way to do when one

has "the blues"? What is the most cowardly way to do? Which are hurt more by cigarettes, bright boys or dull boys? How can alcohol make one think he is strong? Name some drinks that contain alcohol. Name accidents that are often caused by alcohol. Which hurts a man more, getting drunk now and then, or drinking every day without getting drunk? How does alcohol affect the mind? What does every man think when he takes the first drink? Tell the story of the man and the thing. Tell the story of the boy who had enough pride to quit the use of cigarettes.





XVII.—HOW THE MUSCLES DO THEIR WORK

WHAT moves the clouds as they drift by? What moves the street car? What makes the engine move? What moves the bee as it flies through the air? What moves the kitten as it frisks about? The things which are not alive cannot move themselves. In what way is a bee or a gnat greater than a giant railway engine?

How do we move? We move by means of our muscles. Why is it that the muscles are of so great use in every movement? It is because they can shorten themselves and then lengthen again. The nerves arouse the muscles and the muscles move the bones. The bones are the frame of the body, and when they move the body must move.

The body, not including the head and

limbs, is called the trunk. There is a sheet of muscle across the trunk which divides it into the chest and the abdomen. The walls of the chest are made of bones and muscle. The walls of the abdomen are chiefly muscle. The chest holds the heart and lungs. The abdomen holds the stomach, liver, and other parts.

Can we control all our muscles? The heart is a muscle; it beats even during sleep. There are other muscles besides the heart that we cannot control. The stomach is a muscular bag in the trunk at the waist. The stomach sometimes throws up injurious things. It will throw up tobacco, if a tobacco chewer should happen to swallow some of it. Since the stomach is not under control of the will, the chewer cannot prevent the vomiting. We are not wise enough to take care of the heart and some other muscles, so they are not left under the control of the mind.

We can see the shapes of some of the muscles, especially if they shorten, for then they swell out. Muscles are of a reddish color. Red beef is muscle. Some of the

muscles are fastened directly to the bones. Others end in strong white cords (called tendons), and the cords are fastened to the bones. Can you feel the cords in the back of the hand when you work the fingers to and fro? They are the cords by which the muscles in the forearm move the fingers. Did you ever pull the white cords in the leg of a chicken that had been killed? What was the effect upon the toes? Would you like to know why so many of the muscles taper into hard white cords? It is simply to save room. The fingers need so many muscles that there is not room to fasten all the muscles to them. Our ankles and wrists would be very clumsy if it were not for these cords. (See Fig. 5, page 44.)

The muscles depend on the blood. The blood brings food which keeps them healthy, makes them grow, and gives them strength. If we would have strong muscles, we must give them pure blood. To have pure blood, we must breathe pure air and eat enough good food. Some children wake up late and hurry off to school without eating breakfast. At noon instead of eating

wholesome lunches of bread, butter, and fruit, they eat pickles and cookies. Such things are worth little as food, and they may weaken the body.

THE KING AND THE WONDERFUL CLUBS



1. There was once a great king in India who became ill. He had many learned doctors to visit him, but they could not cure him. So he was just as unhappy as if he had not been a king.

2. He had slaves that fanned him whenever he was warm, with immense fans made of peacock feathers. The slaves held a large parasol over him when he walked in the gardens of the palace. When the king was well enough to go abroad, he rode on a great elephant. He wore a crown of gold set with diamonds and rubies. Yet he was ill and always unhappy.

3. At last a great doctor came into the kingdom. He cured many poor people who were about to die. His fame reached

the king, and the king sent for him. This doctor told the king that he must have some large clubs made of camphor wood, and must swing these clubs for a long time twice each day. When his hands became moist, the king would know that the medicine in the clubs was passing into his body. If the king would use the clubs every day, he would soon be well. The king did so, and was quickly cured. He gave the doctor a bag full of silver and gold.

4. The doctor knew that the king was sick only because he did not work with his muscles. He knew also that if he told him to work hard twice a day until he perspired, the king would not do it. He therefore told him about the medicine in the clubs, and the way to have it do him good. Work with the clubs cured the king, although the other doctors with all their drugs could not help him.

Write an outline of this story in six lines. (See page 25.) Take it to class. The teacher will decide which of the outlines written by the pupils is the best and will have it placed upon the board, that all the class may follow it in writing the story from memory.

XVIII.—HOW THE MUSCLES ARE KEPT SOUND AND STRONG

How does exercise make the body healthier? It does so in many ways. When you use your muscles, your face becomes red. This shows that the blood is flowing well; thus the blood feeds and purifies every part of the body. You take deep breaths, and by doing so make the lungs grow. Your food is used up by the exercise, so you are hungry for simple, healthful food. The muscles themselves grow stronger from being used. Sweat is given out, and helps to make the blood pure and the skin healthy. You feel better all over.

Which of your arms is the stronger? Why? If your muscles are used much, they become large and strong. If not used, they become small and soft. Children of rich or foolish parents, who give them no work to do, are to be pitied. The work about the house is done for

them by servants; so their muscles do not grow large and strong. Because they

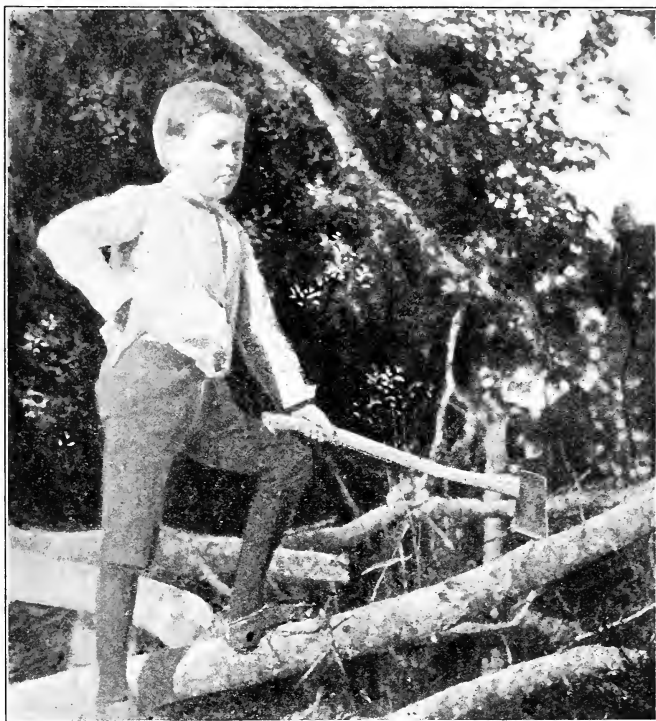


FIG. 12. — READY FOR WORK.

do nothing useful for others, they are likely to grow up selfish and unhappy.

Children sometimes have to work in the mills or fields for many hours each day, even when they are small. They do not

have time to rest and play, so their bodies are stunted. The food they eat is used in work and not in growth. In many states there are laws against so cruel a custom.

Good clothes are a blessing if you do not think too much of them instead of thinking of more important things. Clothes should not be so fine, nor made so tight, as to hinder work or play. A child is of more value than the finest clothes. Strong, loose clothing, that permits the free use of the muscles, is the best.

Girls should romp and play as well as boys. Health is as great a blessing to a girl as to a boy. No one can have good health without exercise. Active and industrious boys and girls are likely to have big, strong muscles and plump, handsome forms.

Exercise not only helps the muscles, but it helps the mind. It sends fresh blood to the brain and helps you to learn your lessons more easily. Most games improve the temper and spirit. They train children to be brave, prompt, patient, and fair.

It is foolish for girls to jump the rope as long as they can. Children, and grown people, too, under the excitement of a contest, often do themselves more harm than good by straining themselves, or by continuing at exercise after they have become



FIG. 13. — LEAP-FROG.

tired and sore. Racing, jumping, throwing, wrestling, are good exercises; but while at them we should think as much of the good of the body as of winning the game, or of making a record.

During sleep, the muscles and the brain get back their strength from the blood that is flowing through them.

A long time ago, sickly women were sometimes proud of being weak, because they thought the weakness showed they were gentle and refined. A sickly body is not refined, and is usually unclean. *Now*, no woman is proud of being weak, and many women are strong. It is a shame that so many are still weak and sickly. This is often because they loll idly at home, and, when they go out, dress so that they cannot draw a deep breath.

Which has more fat, a hog or a dog? Which has more muscle? Which can run the faster? Why? Which usually has stronger muscles in the arm, a boy or a girl? Why? How does exercise help the mind?





XIX.—THE BONES AND JOINTS

Do you think the bones in our bodies are just like those which we see lying on the ground? Certainly not. Our bones are pink and moist and alive, for the bright red blood flows through them. They are heavier than the dry, white bones. How many bones do you think there are in your body? There are more than two hundred.



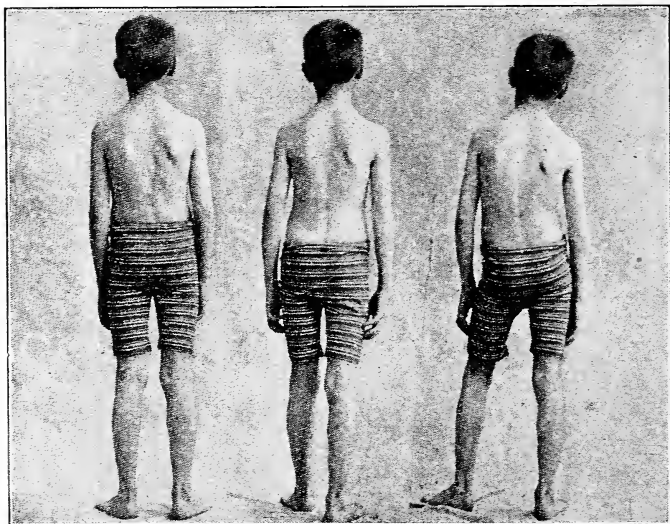
FIG. 14.—THE SLUG.

Its body is soft ; it has no bones.

The ends of the bones fit together and form joints. The bones are held together at the joints by tough bands. If a joint is turned too far, the bands may be stretched or torn. This is called a "sprain." When a joint is sprained, it should be held in hot water for an hour or two. Then it should be kept still for a few days, or until the pain ceases.

Careful rubbing may help the joint to get well.

There is a liquid formed in the joints to make them work smoothly. You may have noticed that some people are much



Too Stiff.

Just Right.

Crooked.

FIG. 15.

more supple than others. This is because they keep their joints from becoming stiff, by using them.

It takes over twenty-one years for the body to become full-grown. Most people grow a little until they are twenty-five years

old. For the bones to grow well, they must have good food. When blood containing poison, such as tobacco, enters the bones, it tends to stop the growth. If you know any boys that have smoked cigarettes for

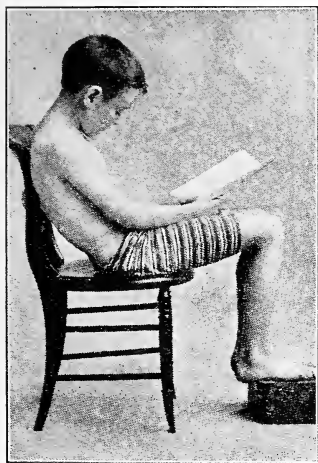


FIG. 16. — SLIDING DOWN
IN THE CHAIR.



FIG. 17. — SITTING BACK
IN THE CHAIR.

several years, you will, perhaps, notice that they are not so large and strong as other boys of the same age.

While we are young the bones are soft and easily bent. This is the time to be sure that they take the right shape. Into whatever shape our bodies grow when we

are young, that is the shape they will have when we are grown. Have you ever noticed how easy it is to slide down into a chair or seat, or to bend over your sewing and reading? *You can grow to be erect and graceful, or stooping and bent. Which will you choose?* That body grows into the most graceful form which is least confined by tight clothes. Boys and girls that go barefooted or wear sandals all the summer will be likely when grown to have straight, springy, and perfect feet.



FIG. 18. — A MOCCASIN.



XX.—THE CARE OF THE BONES

THE Indian mother ties her baby on a board, wraps it up in a shawl, and carries it on her back. When she reaches home, she takes the baby from her back and leans it against a tree or hangs it from a branch. Among the tribe called "Flat-heads," another piece of wood was tied against the forehead of the baby so as to press upon the skull. Thus the skull grew flat in front. The head was flat for life.

Some Chinese women bandage the feet of their little girls, so that a full-grown woman sometimes has feet no larger than those of a young girl. At times young people in this country crowd their feet into shoes that give the bones no room to grow. Hence many people here have feet shaped

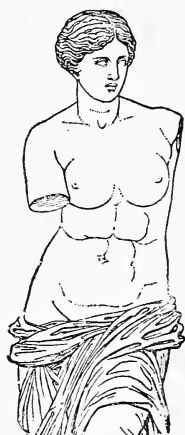


FIG. 19.

more like queer clubs than real feet. Many women tie the ribs down with skirt bands so that the ribs cannot rise in breathing. This injures the lungs, the liver, the heart, and the stomach. Girls that are to grow strong and plump and rosy and handsome, need as much room for their lungs and livers and hearts as boys do. Clothes tight around the waist squeeze up the lungs, deform the liver, push the stomach out of place, and may make the wearers round-shouldered.

A little girl went to a store with her mother to buy shoes. The clerk showed them a pair of gilt shoes with high heels. The shoes were too tight for the girl's feet, but she was afraid the man did not have a larger pair of the same kind, so she said they were all right. The next week she went with her mother to spend the day with a friend. She played in the yard with the other children, but her shoes hurt so that she could not stand it. So she pulled them off and went barefooted. When her mother looked out the window she thought her daughter had brought

shame upon them. As the girl grew up she still thought more of her clothes than she did of her body; so now her toes are crooked and covered with painful corns.

THE CRIPPLED BOY

1. Once there was a boy who was lame. One of his legs had been cut off by a railway train. One night he went to an auction. There were many beautiful things for sale, but when he saw a pair of crutches made of cedar and brass, he could think of nothing else. The boy wanted the crutches, oh, so badly!

2. He had five dollars in his pocket. When the crutches were held up for sale, he bid two dollars. There was a rich man in the crowd who wore the most costly clothes. He bid against the crippled boy, and said three dollars. The boy cried out four dollars. The man said four dollars and a half. The boy looked at the man with tears in his eyes, as much as to say: "Please do not bid any more. I haven't much money."

3. The boy then bid five dollars, all the money he had. The man called out six dollars. The boy's heart sank as the beautiful crutches were handed down to the man. He took them and walked over to the boy and said, "Here, little boy, I wanted them for you all the time." You see the boy had only been getting in the way of the man who wanted to help him.

4. This story reminds us of some people who are always anxious about themselves. If they are slightly ill, they worry all the time and take all kinds of medicine. They are always thinking about themselves and trying to do something for themselves. If they would only cease to be anxious and have a little faith and trust and begin to live properly, the natural strength of their own bodies would make them well. If they would trust in pure air, simple food, useful labor, and contented minds, good health would come to them as a free gift.



XXI.—REVIEW

How do muscles move the body? What does the abdomen contain? What does the chest contain? Name muscles that are not controlled by the mind. Why is it well that they are not controlled by the mind? What are tendons? When can they be felt? Why are tendons needed? How do the muscles depend upon the blood? Tell several ways in which using the muscles helps other parts of the body. Why should children work? What is the best kind of clothing? How does exercise help the mind? How do games help children besides making their bodies strong? Why are so many women sickly? How may girls grow up healthy and strong? Can children do themselves harm while playing? How do muscles get strong during sleep? What is the color of muscle?

What is the difference between a bone

lying on the hillside, and bones in the living body? What is the number of bones in the body? How are joints formed? How are the bones held together? What is a sprain? What should be done for a sprain? What keeps the joints smooth? What is the effect of cigarettes upon the bones? Why should we sit erect and stand erect? How does going barefooted when a child affect the feet when one is grown? What harm is done by clothing that is tight around the waist?

When one begins to feel ill, what is the best way to get strong again?

Tell the story of the king and the wonderful clubs. Tell the story of the crippled boy.



XXII.—WHY WE EAT



WHY is it that you grow so fast? The food you eat, the water you drink, and the air you breathe, all help to make you grow.

Why is it that a small tree in a few years will grow large enough for you to climb? It is because the roots of the tree take in food and water from the soil, and the leaves of the tree take in air. A plant can eat dirt, so to speak; but we must eat plants or the flesh of animals that eat plants.

Food makes the body grow, but it does more. A full-grown person never grows any taller, yet he eats three meals a day. See the big engine puffing at the railroad station! It has a tender full of coal which the fireman is often throwing with a shovel into the engine. The engine

takes water into the boiler, yet the engine does not grow. These things keep the engine hot and enable it to run. So with us, there is a kind of slow fire in our bodies, and our food feeds this fire. So the food we eat and the air we breathe *keep us warm* and enable us to *move and work*.

Food does still another thing for us. *It keeps us from wearing out*. The engineer often oils the joints and polishes parts of the engine that they may work smoothly, but some parts of the great engine wear out after a while, and these pieces have to be replaced by new ones. The food keeps our bodies from wearing out, by repairing them every day. Thus we learn that food does several things for grown people, and all these and one more for children.

Wash your fingers and feel your front teeth. Feel your back teeth. How do the front teeth and the jaw teeth differ in shape? What do we use the front teeth for? The jaw teeth?

Every one has two sets of teeth. If a tooth of the second set decays or is pulled

out, no tooth will ever grow in its place. If a tooth aches or if you see a hollow in it, you should go at once to a dentist.

The teeth should be washed twice a day. You should use wooden toothpicks, and should never use pins or anything else

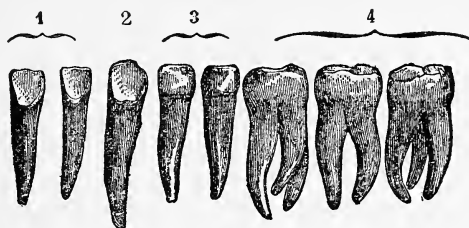


FIG. 20. — THE TEETH OF THE RIGHT SIDE OF THE LOWER JAW.

hard. It is not good manners to suck the teeth or make sounds with the mouth or to chew the tooth pick. The teeth should be picked quietly and quickly, but it is not necessary to go away alone or to hide while picking them.

THE STOMACH AND THE MEMBERS

(A FABLE)

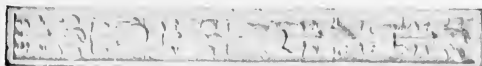
1. The Members of the Body once rebelled against the Stomach, who, they said, led an idle, lazy life, while they had all the work to do.

2. The Hands declared that they would not again lift a crust, even to keep him from starving; the Mouth said it would not take in a bit more food; the Legs said they would carry him about no longer, and so on with the others.

3. The Stomach quietly allowed them to follow their own courses. He well knew that they would all soon come to their senses. And indeed they did, for, from want of the food supplied from the stomach, they found themselves fast becoming mere skin and bone.

—ÆSOP.





XXIII.—HOW THE FOOD IS CHANGED WHEN IT IS EATEN

THE food we eat must be changed before it can make stout arms, strong bodies, and busy brains. In the ripe, rosy peach do you taste anything like the gritty, sandy soil from which it grows? Does the bright rose look like the dark soil in the flower-bed? Yet the peach tree and the rosebush get their food from the soil, and it is then changed into flower and leaf and fruit.

So the bread and meat and potatoes a man eats are changed into bone and hair and muscles and nerves. The food from the earth gets into the sap of the plant. If our food can only get into the blood, the blood will carry it all over the body, and each part will pick out just what it needs. A red apple on a tree may help in a short time to make the fat in your cheeks. A

turkey may be strutting about, and in a few days part of it may be changed into the muscle on your arm.

The changing of the food, so that it can pass into the blood, is called *digestion*. Digesting food consists chiefly of dissolving it, or changing it into a liquid form. The object of digestion is to separate the useful parts of the food from the hard and useless parts, and to soften and dissolve the useful parts so that they can pass into the blood to be carried to every part of the body.

Only the waste matter, such as seeds, rinds, and husks, should remain to be driven on and out of the body. If this waste matter is not given off, it may cause headache or a dull and stupid feeling, and it sometimes causes sickness.

The food is digested in a long tube called the food canal. This canal is made of muscles, and its walls contain many little pits or glands. The food canal has four parts: first, the mouth, second, the gullet, third, the stomach, and fourth, the intestines. The glands of the mouth form saliva (sā-lī'-vā); the

glands of the stomach form an acid juice; the glands of the intestines form several juices. The saliva and other juices digest the food.

If a person chews gum, the glands are deceived and form fluids when they are of no use; later, when the fluids are needed, the glands are tired and cannot form them. Chewing gum is not only bad for the digestion, but many people believe that it makes the lips grow thick and ugly.

Chewing tobacco is worse than chewing gum. Not only is the saliva wasted by spitting, but some of the tobacco soaks in through the lining of the mouth. It goes into the blood and weakens the body. A boy once said he used tobacco because he wanted to be like a man. A teacher asked five boys what kind of men they wanted to be. Different boys said, "strong, tall, wise, healthy, rich." What kind of a man will tobacco help to make of a boy? Will it help to make him a rich man or a poor man? Why? Will it help him to be wise? Will it make him strong and tall? Will it be more likely to make him healthy or sickly?

TWO KINDS OF SOUP

1. It was time for dinner. Mary sat at the table with an ugly frown on her face.

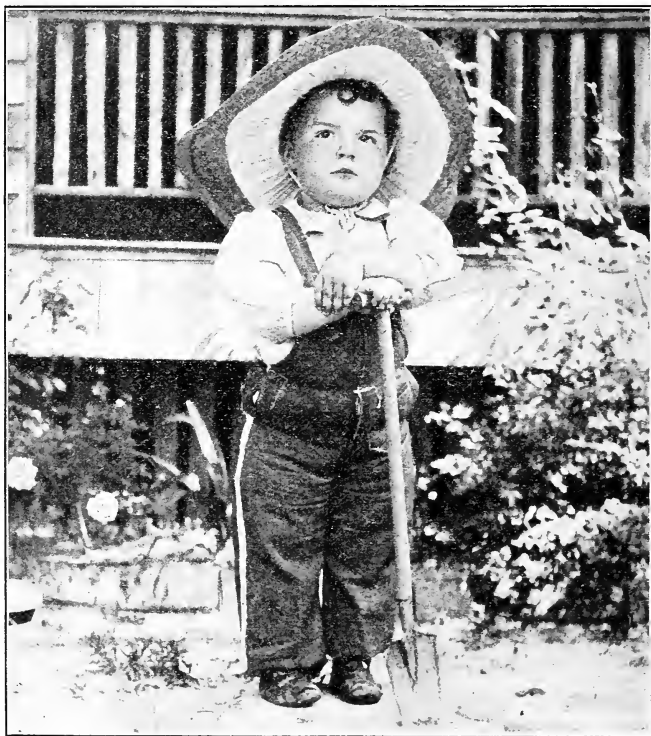


FIG. 21. — A TIRED GARDENER.

“I can’t eat anything, mamma,” she said.
“This soup isn’t good. I wish you could make something better.”

2. Mamma smiled and said, "I think we will have something better for supper. Get your hat and let us work in the garden and fix the flower beds."

3. In the garden there was so much to do, — flowers to water, weeds to pull, and seeds to plant. The minutes went by so fast that the supper bell rang long before Mary was ready.

4. How hungry she was! How nice the soup tasted! "Mamma," said the little girl, "this soup is so good. May I have some more? I wish we could always have such soup."

5. "Perhaps we shall if we work in the garden every day," said mamma. "This is some of the soup we had for dinner." Mary could not understand at first why the soup was so good. Can you?

Write this story without looking at the book.



XXIV.—A TALK ABOUT EATING

OF what are the walls of the stomach made? When food is in the stomach, the walls of the stomach slowly lengthen and shorten so as to mix the food well. We should eat only at meal times, for the muscles of the food canal need rest. Even a little candy will keep the stomach at work and tire it out. Any one that eats little bits of food a short while before dinner is likely to spoil the pleasure of the meal.

The stomach cannot digest green apples, but it tries hard to do so. It stirs the apples faster and faster until it aches with pain. Green apples must either be thrown up or they must pass unchanged through the food canal. If potatoes and meat are swallowed in lumps, instead of being well chewed, the muscles that form the walls

of the stomach have to work very hard. If the mouth does not do its work well, the stomach must do the mouth's work too; but it cannot chew—it has no teeth.

Do you know a little girl who never has a good appetite when she goes to the table? She nibbles at things like a squirrel, but does not eat heartily. Can you tell at once what is the matter? Why, her stomach is always tired. She is always eating candy and pie and cake between meals. She doesn't look well, and she is not as happy and pleasant to play with as she might be.

Eating too fast or too much, and at all times of the day, makes more children sick or sickly than anything else. What good appetites children have who breathe pure air and who work and play out of doors every day! How light and happy they feel! They are not nibbling food at all hours of the day, but how they enjoy each meal!

TANTALUS

1. Did you ever hear the word "tantalize"? Fred was down town with his

mother, and saw her buy something pretty for Annie. Fred got home before his mother came. Annie tried to get him to tell what it was. He teased her a long time, and Annie said, "How you do tantalize me!" This was a long word for a little girl to use.

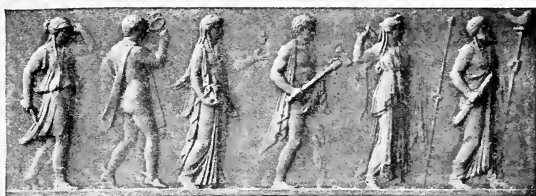
2. The ancient Greeks lived a long, long time ago. They used to tell a story of a man named Tantalus who had done some wicked deed. The Greeks believed in many gods, and they said that one of the gods, in order to punish Tantalus, had placed him in water up to his chin. Great clusters of ripe grapes, red apples, juicy oranges, and other fruit hung just out of his reach.

3. If he stooped to drink, the water sank. If he reached up to pluck the fruit, that rose higher. The water always stood just below his mouth, and the fruit just out of his reach. He was always hungry and thirsty, but never got anything to eat or to drink.

4. Some people do not stop eating when their hunger is satisfied, but eat and drink

as much as they please. They keep doing this for years and never work hard to make themselves hungry in a healthy way. After a while they can digest only a very little of the food they eat. They become thin and half-starved. They are always hungry, yet when they eat, the food gives them pains and aches and does not satisfy their hunger.

5. They suffer if they do not eat, yet they suffer still more if they do eat, and the food they eat does not pass into their blood after all. How are they like Tantalus? Do you now know what the word "tantalize" means?



XXV.—STRONG DRINK



ALCOHOL looks like water. It has a hot, biting taste. When taken clear, it burns the mouth, throat, and stomach like fire; hence the Indians call it "fire water." No one likes the taste of alcohol; but by mixing much water and sugar and other things with it, the drinker hides its taste. Some of the pleasant flavor of the grape and the apple hides the repulsive taste of the alcohol in grape wine and apple brandy. Beer is so insipid that bitter hops are added to give it taste. The warning of the sense of taste may cease after it has long been abused.

Why is alcohol used? If the drinker's nerves are telling him that he is tired, the nerves are so dulled by the alcohol that he no longer feels tired. If he has been timid or fearful, his mind becomes too confused



FIG. 22. — THREE MEMBERS OF A TEMPERANCE SOCIETY.

to see any cause for fear, and his fear leaves him. A man under the influence of strong drink thinks he can whip anybody, and he is likely to quarrel and get into a fight.

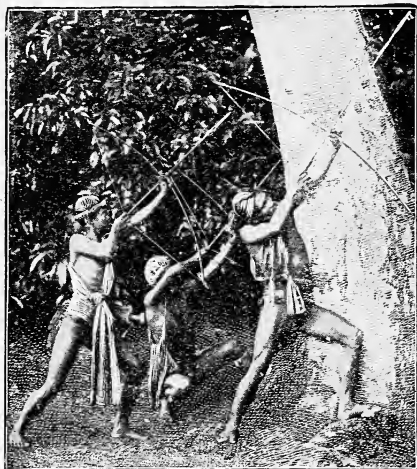


FIG. 23. — HUNTING IN THE PHILIPPINES.

If men always took plenty of exercise, and did not deform their bodies with tight clothes, and if they breathed pure air out of doors as wild tribes do, they would not need beer, wine, etc., to deaden their nerves.

He may believe that he is brighter and wittier than usual, when he is saying only foolish things. If he trades with a sober man, it is easy for the sober man to get the better of the bargain.

Yet he cannot whip any one except perhaps his wife and children.

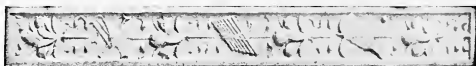
Careful tests have shown that one who has taken even a little alcohol cannot add up a column of figures so quickly as before. He cannot shoot a gun with so true an aim as usual.

When a person takes only a small quantity of alcohol he cannot think so clearly as he can when he has taken none at all. He lights his pipe in the barn and throws the match into the hay. He fastens the harness so that it causes the horse to run away. He loses his self-control, and becomes angry at every little thing.

If he keeps on drinking, he cannot move his legs properly, and staggers as he walks. His eyes roll without his will and he thinks the ground is moving, so he tries to step uphill on level ground. He thinks his friend staggers instead of himself; he thinks his friend is drunk and he himself is sober. After a while, the whole brain gets weak and cannot act. The man lies down in a drunken sleep and cannot be waked up. His body is truly poisoned.

What is the way to escape the terrible effects of strong drink? *Never take the first glass.* There comes a time in the life of every drunkard when he wants to stop. Yet many cannot stop, although they see ruined lives before them, for the habit has destroyed the will power.

Perhaps the strangest thing about alcohol, opium, and some other drugs is that when the use is once begun the user wants more and more all the time. People who begin with wine, cider, or beer are apt to want brandy or whisky after a while. If a person takes opium a few times, he soon wants to take more opium. Thus a terrible habit is formed. Soothing sirups for babies often contain opium. It is a great wrong to deaden a baby's brain with opium. When he grows to be a man, he will not have so good a brain as he would have had if his mother or nurse had given him good care instead of opium.



XXVI. — REVIEW

WHAT is the difference between the food of plants and that of animals? Tell several things that food does for us. How do the teeth differ in shape? Tell what you learned about taking care of the teeth. Repeat the fable of the stomach and the members.

What is digestion? Why is it necessary? Name the four parts of the food canal. Why is chewing gum bad for the digestion? Why should we eat only at meal times? Why does chewing the food well help the stomach? What kind of children have the best appetites?

What does alcohol look like? Why do the Indians call it "fire water"? What hides the taste of alcohol in wine and brandy? Why are hops added to beer? Why do men drink alcohol? What is the effect of a little alcohol upon the mind? What is the effect of large drinks of alco-

hol? Why does the drunken man think he is sober, and that other people are drunk? What is the only safe way to avoid the danger of becoming a drunkard? Why do some people begin the use of alcohol or tobacco, although they know it is wrong? Why is there danger in the first use of alcohol or opium?



XXVII.—PUTTING KNOWLEDGE INTO PRACTICE

MANY boys begin to smoke cigarettes because they are cowards. It is not only necessary to know the truth; we must be strong-minded enough to act upon the truth when we are with people who are blind to it. A boy may know it is wrong to drink, yet when he is with other boys who do not know it, he may drink with them for fear of seeming queer. He is afraid of being laughed at by boys a little older than he is. It is not because such a boy is manly that he follows other boys into a saloon, but it is because he is a coward. The boy who refuses to go into a saloon will be admired by the other boys for his manliness; while they see that another who follows them for fear of their laughter is really weak and cowardly.

If you have friends that do not know of the bad effects of alcohol and will not learn, you can find other friends that do not think

a glass of beer necessary for having a good time. There are safer and more useful friends than those who invite you to drink beer in a saloon.

Drinking wine has led thousands to become drunkards. Some people have drunk a little wine or beer every day for many years, and have not been harmed very much so far as others can see. Most people, however, that drink alcohol in any form, drink more and more every year. Alcohol, opium, cocaine, and several other drugs all tend to make users take more and more the longer the drugs are used.

A person may eat too much bread, but the bread does not cause a desire for too much bread next time. If you make yourself sick by eating too much candy, you do not have a still greater desire for candy; you may instead lose your fondness for candy for a while. But a person who gets under the influence of alcoholic drink has a craving for it awakened, and he is left with a stronger craving after each indulgence. Can you learn the following poetry by heart?

They are slaves who fear to speak
 For the fallen and the weak ;
 They are slaves who will not choose
 Hatred, scoffing, and abuse,
 Rather than in silence shrink
 From the truth they needs must think ;
 They are slaves who dare not be
 In the right with two or three.

—JAMES RUSSELL LOWELL.

THE BOYS AT THE CONCERT GARDEN



1. One night five boys went together to a concert garden in Louisville, Kentucky, to hear some beautiful music by a large band. They were sitting by a small table, and during a pause in the concert one of the young men said, "Let us have something to drink."

2. They called a waiter, and four of them ordered beer. The fifth boy called for lemonade. Several of the boys giggled, and one of them said: "Perhaps the waiter had better bring you a glass of milk. All children like milk." But the young man said: "He may bring lemonade, but if there is none, I would rather have milk

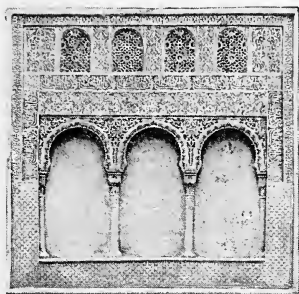
than beer. A glass of cool water will do."

3. One of the boys said: "Water is good for women and children, but if you want to be a man you must drink beer. Beer makes you jolly." The young man replied: "I am jolly because I myself feel that way. I do not need to drink beer that I may get a good humor."

4. Ten years afterward, two of those boys were drunkards rolling in the gutters. One was a regular drinker who was drinking more and more each year. Only two of them were sober, and one of these was the boy who would not touch beer at the concert garden. He is now a rich merchant.



XXVIII.—THE COST OF DRINK



STRONG drink still deceives so many people that every year the drinkers of the United States pay more for alcohol than the whole nation pays for bread. Alcohol is the greatest of all destroyers of wealth. The work of thousands of men is wasted each year making and selling strong drink.

Many people own no homes because of beer and whisky. The price of two or three drinks a day, if saved, would buy a home in ten years. After the habit is formed, the desire for drink is so strong that the drinker will pay for whisky if it takes all his money. The kind doctor that attends his family in sickness must go unpaid. Whisky costs the doctors hundreds of thousands of dollars each year. The

merchant cannot be paid because the drunkard cannot work. So he must charge sober people higher prices to keep up his business. The mother and children must work, and the children cannot go to school. Three fourths of the paupers, half the arrests, three fourths of the crimes, result from drink. The expenses thus caused, with the expense for making the alcoholic drinks, amount to over a billion dollars every year. The misery and suffering of the families of those who love alcohol cannot be expressed in money.

WHAT THE WEED SAID TO THE CORN

I. There was once a farmer who carefully cut down the weeds that came up in his field. But there was one weed of which he took the greatest care. It had a bitter, burning taste, yet he planted the seeds of it every year.

A stalk of corn leaned over the fence into the field where one of these weeds grew. The weed held its head very high and proudly, and the corn asked: "Will

you tell me of what use you are, and why you are not cut down like other weeds? Do you enrich the soil where you grow?"

"No," replied the weed, "I make the soil poor more quickly than any other crop that can be raised."

2. "Can you feed the hungry?" asked the corn.

"No," answered the weed, "unless it be an ugly worm. Some men and boys chew me when they are hungry and think that I am food, but I am only fooling them."

"Perhaps you clothe people, like my friend Cotton across the road," said the corn.

"No, no," replied the weed, "no cloth is ever made from me. I never clothe anybody, but I have known many a child to wear thin clothes all winter because his father spent so much of his money for me."

3. "If you are good for neither food nor clothing, then what *are* you good for," snappishly asked the corn.

The weed tossed its head to one side and replied: "I am good for nothing. But I don't care. I am more important than

you. Every year people spend more money for weeds like me than for bread. Men love me."

4. "Why do they love you?" asked the corn.

"When they feel bad, I deaden their nerves, so they think that I make them strong and happy. I really take away their strength and health. I am only a weed, yet I am more powerful than any king in the world."

"This is all very strange," said the corn.





XXIX.—KINDS OF FOOD

SOME animals can live on only one kind of food. Cows and horses can grow and keep healthy on grass alone. But we must eat several kinds of food. We should eat food that contains fats, sugar, and starch, for they give heat and strength. We should eat lean meat, cheese, beans, and nuts, for they repair the body and keep it sound.

People who live in warm climates live chiefly on fruits and nuts. It is not good for them to eat much meat.

Would you think that people who live in cold climates would be very fond of fat? They are, for they need it to burn in their bodies to keep them warm. You know what a big fire fatty things make; perhaps you have seen grease or butter or oil burn.

Once some sailors made a Christmas tree for the Eskimo children in the far North.

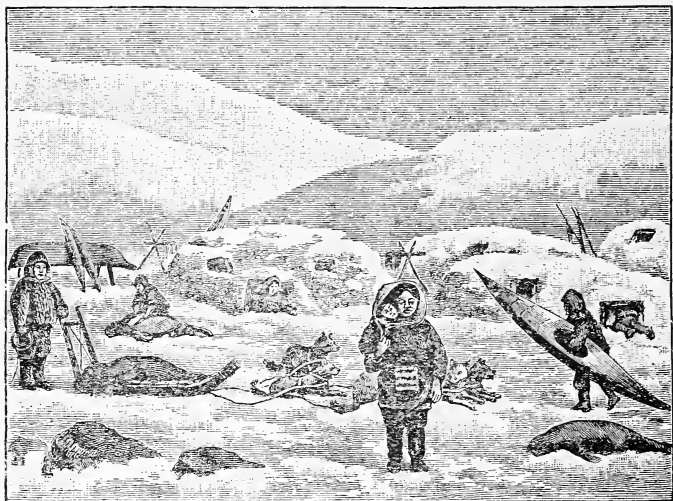


FIG. 24. — AN ESKIMO VILLAGE.

Write about this village and tell everything you see in the picture.

They tied some walrus bones together and hung balls of whale fat on them. The children were better pleased than if there had been oranges and apples on a real Christmas tree.

Candy is made of sugar. Sugar gives heat and strength to the body. Hence candy is a useful food. Why do people object to it so much? Simply because it is eaten at all times by careless people; often the stomach needs rest, and the

body already has enough food. Sugar dissolves in water. One way to test whether or not candy is pure is by putting a piece of it into a glass of water. If it is not pure, you will find some white earth in the bottom of the glass, or perhaps the water will be colored by a dye. If you do not have enough sugar in the food you eat, you can eat home-made candy. Such candy is pure, but even it should not be eaten in large quantities or between meals.



XXX.—FRUITS, NUTS, AND VEGETABLES

IN hot countries people eat a great deal of fruit. Fruits contain much water. Besides this, they contain sugar and several



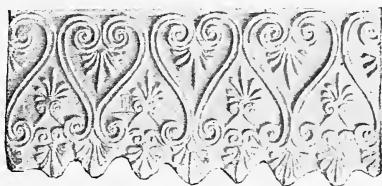
FIG. 25. — BUD, BLOSSOM, AND FRUIT OF THE ORANGE TREE.

mineral salts. We should be careful not to eat overripe or unripe fruit. Ripe mellow fruit may be eaten between meals, for it is digested so quickly that it does not tire the stomach. Nuts are a very fine food, but green nuts and rancid nuts are very bad for the stomach.

Cabbage, turnip leaves, lettuce, mustard, and other leaves used as green salads, do not nourish the body, for leaves are made of woody fiber. The cow can digest woody fiber, but man cannot.

Mustard and pepper burn the stomach just as they burn the mouth. Did you ever see what a mustard plaster could do for the skin? Spices do not feed the body. They may hide the taste of bad food, and may make you eat too much.

Fruits, nuts, grains, and other simple foods are best. If we eat only when we are hungry, we enjoy food better than those who eat simply for the pleasure of eating. We will also have good health. A man asked three boys what each wished for most in all the world. The first said money, the second said fame, the third said health; "for," said he, "fame and money would be useless without health, and a man must have health before he can win fame and money. Life itself depends upon health."



XXXI.—WATER AND MINERALS

WE need several minerals, among them, lime, common salt, and iron. Common salt is found in the earth. It is the only mineral that we eat just as it is dug from the ground. You have noticed how hard bone is. Why is it so much harder than flesh? It is because the bones have lime in them. We get lime for our bones when we eat grains made into bread. Milk has some lime. The cow gets lime from grass, and the growing grass gets lime from the soil. We get iron from tomatoes, peaches, and grains.

About three fourths of the body is water. If you weigh eighty pounds, sixty pounds of your body is water. We should drink plenty of pure water. Water is needed by the blood. Without plenty of it, we should become very thin and lean. We could live without other food for several weeks, but

we could not live without water longer than one week.

Water is everywhere in the body. The teeth have less water in them than any other part of the body. Do you think of anything that tastes better than a glass of pure, cool water when you are very thirsty? Water

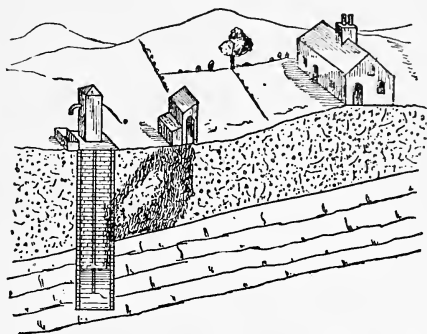


FIG. 26. — AN UNCLEAN WELL.

that is neither warm nor cold, but cool, quenches thirst the best of all.

We can easily have cool water by keeping it in a large tin pail, around which a wet cloth is tied. The water in the cloth is constantly going into the air and taking heat with it. The cloth is kept damp by setting the pail in a pan of water. We should be careful to drink clean, pure water. (See the picture of an unclean well, Fig. 26.)

You should not drink cold water just

after you have been running. If the bread you are eating is dry, do not wash it down with large quantities of water. It is much better to eat slowly and let the saliva moisten the bread. Children should not use tea and coffee. These drinks make their nerves weak and their skin sallow.





XXXII.—A GOOD APPETITE

ACTIVE, healthy children have good appetites and enjoy best pure, simple food. Such children have bright eyes, seldom have headaches, and feel well and strong; their skin is clear and their breath is pure. Bad breath is a "tell-tale." It tells of bad habits and unclean living. People who eat enough, and not too much, pure, simple food, who take exercise, breathe pure air, and take care of their teeth, do not have bad breath.

You should not run or work hard just after eating. Men who drive horses understand this. The horses must be given little food at noon, or they must be driven slowly until the digestion of the food has well begun.

After the food is digested, it soaks into the little blood vessels in the lining of the food canal. It is then taken by the blood

to all parts of the body. In this way, each hungry part gets what it needs.

Which of the foods that you ate for breakfast came from animals? Which from plants? Did you eat any minerals?

THE TROUBLES OF AN IGNORANT FAMILY

1. When children reach the higher grades of school, they study about all the parts of the body, and about every kind of food. They learn why people are sick, and how people should live in order to keep well.

2. Both the father and mother in a certain family had never studied about these things, or if so, they did not heed what they had learned. Almost everything cooked was soaked in lard. Even the bread was made with much lard, and it was often yellow with soda. This family ate as much fat meat and molasses in summer as they did in cold weather. They often ate a big supper just before going to bed. The father used tobacco. Even the small children were allowed to drink strong coffee.

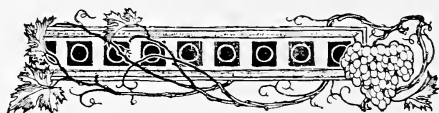
3. The usual answer of members of this family to the question, "How are you?" was "Only tolerable." Some one of the family was nearly always sick. The father spent for doctors and drugs half of the money he earned. They were never out of debt, and even owed for their home. They lived in the country, where there were many nut trees in the woods, such as hazelnuts, chestnuts, walnuts, and pecans.

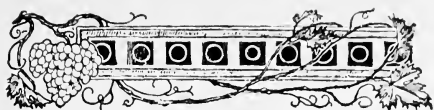
4. Now there is more oil in nuts than in fat meat. They are good, strengthening foods in every way. Yet this ignorant man and his sons would gather nuts, take them to town and sell them for five cents a pound, and then they would buy pork at fifteen cents a pound. As the man was in debt and not sure to pay, the merchant charged him five cents a pound more than if he had paid cash for the pork.

5. This pork had been hauled in dirty cars, it had stood on dirty platforms, and had been piled on the floor of a store where men had been spitting tobacco. It was rancid stuff. Yet it was all the meat the

man's family ate, for they were too ignorant to eat the nut meats, or kernels, for food at meal times.

6. Potatoes would have been better for bread than the yellow, soda bread they ate. No wonder the man never got out of debt. He sometimes drank whisky to help him bear his troubles, but doing this only made matters worse. The family were taking patent medicines much of the time. They did not know that water alone is worth more than all the medicines in the world; that it can be used to control and break up fevers; that drunk in large quantities it will purify the blood, and that it will make any part of the body pure and clean.





XXXIII. — REVIEW

How does alcohol destroy the wealth of the country? How long would it take the money spent for drink by one moderate drinker to buy a home? Why do the doctors lose money because other people drink? How do other sober people lose money because of drunkards? How much does alcohol cost our country every year?

Name foods that give health and strength to the body. Name foods that repair the body. Why are the Eskimos very fond of fats? Why do some people object to candy? Tell what you have learned about these foods: fruits, nuts, vegetables, spices. What food gives lime to the body? From what does the body get iron? Why should we drink plenty of water? Of what is bad breath a sign?

Tell about the habits of an ignorant family and the results that followed. How might this family have done better?



XXXIV.—HOW AND WHY WE BREATHE

MAN has lived several weeks without food; he could live several days without water; but he could live only a few moments without air. If a person who cannot swim falls into deep water, he is drowned because he cannot get air to breathe.

The breath passes through the nose into a tube in the neck called the windpipe. This tube is made of gristle. Perhaps you can feel it in the front of the neck. The windpipe divides until there are hundreds of branches. The smallest branches end in little round bags. The air goes through the thin bags into the blood, which is just outside of the bags.

When the muscles make the chest walls go out at the sides and front, the air comes into the lungs. When the walls of the chest go in, some of the air is pressed out of the lungs.

The food, in going from the mouth to the gullet, has to pass over the top of the windpipe. There is a little lid of gristle which closes the windpipe while anything is being swal-

lowed. But if we talk or laugh while we are swallowing, the lid opens, and a small bit of food may be sucked into the windpipe. If it cannot be coughed up, the person may soon become

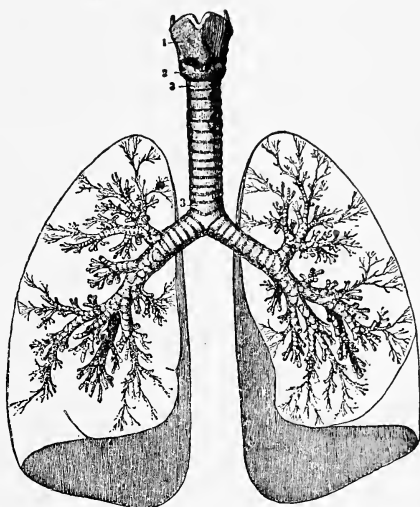


FIG. 27.—THE WINDPIPE AND THE TUBES IN THE LUNGS.

dark in the face because the blood is impure for want of pure air. It is sometimes necessary to take a choking child by the ankles, hold its head down, and strike it on the back between the shoulders.

Why do we breathe? See the blazing lamp. Place a card over the top of the lamp chimney. The flame goes out be-

cause the card prevents fresh air from reaching the flame. There is also a kind of burning going on in our bodies, and we breathe to get fresh air into our bodies that this burning may be kept up.

We breathe in order to give the body fresh air with which to burn the food. This burning keeps the body warm, and does several things besides. (See Lesson XXII.) In winter our bodies cannot make heat enough to keep us warm, so we wear thicker clothing. Do the thick clothes give heat to the body? No, they only keep in the warmth made by the fresh air burning the food.

AN UNTIDY HOUSEKEEPER

1. Fanny woke up early one morning. The birds were singing, the sun was up, and she heard her brother in the yard calling her to come out and play. So she got up and went out to play with him.

2. After a while, she went back to the bedroom, and, whew! she smelled such an odor as she opened the door. She had

closed every window when she went to bed the night before, because the weather was cold. The air was now laden with the foul smell of the bad air which she had been breathing over and over again during the hours of sleep. No wonder she had felt tired and stupid on waking, for she had been poisoned by her own breath.

3. If Fanny had left the door open when she went out to play, she would not have found out how foul was the air of the room. Fanny thought herself a very tidy housekeeper; she had always helped her mother by throwing the bed covers over the foot of the bed to air, and had swept the floor clean every day. But now Fanny found that she was so poor a housekeeper that she had even let the air of her bedroom become foul every night.



XXXV.—HOW TO TAKE CARE OF THE LUNGS

AIR that has been breathed out of the lungs is not fit to be breathed into them again. Dust that enters the lungs makes them weak. Those who live in pure, clean air have few diseases. We should take especial care in ventilating rooms where there are many people. Why? You should help to keep the schoolroom clean.

The dust trough at the blackboards should be cleaned every day *after* school. Before the sweeping, every window should be opened and the floor sprinkled with wet sawdust. Windows should be left open for a long time after a room is swept. Why?

Some people can think of only one thing at a time. If they think of pure air, they forget to think whether the air is warm enough. If they think of keeping the room warm, they do not remember that it can become too warm and filled with impure air. If we live in rooms that are too

warm, we may catch cold when we go out of doors. If the rooms are very cold, we may catch cold in them, even though the air in them is pure. But breathing



FIG. 28.

pure air is the best way of all to keep from having colds.

The feet become cold very easily. To keep them warm and dry, we should wear shoes with thick soles. It is unwise to keep one part of the body warm and let another part be cold. Keeping the neck bundled up makes it very tender. If one stops working when very warm, it is better

to put on a coat or wrap while cooling off. We need fresh air at night as much as in the daylight. We need not be afraid of night air. The weak and tender little birds stay in the night air and are not harmed.

THE SICK SOLDIER

1. One warm day, a poor soldier lay sick in a crowded hospital. The doctors had given up all hope for him, so they put him in an open shed outside the building, thinking that he would soon die.

2. The man was so ill that he did not even know when they put him out of doors. But in a few hours he got better and opened his eyes. He knew by the fresh, cool air he was breathing that he was no longer in the hospital.

3. The sick soldier improved so fast that he was well in a few weeks. The fresh air did more for him than medicine could do in the crowded room of the hospital.

Sick people need pure air more than well people.

XXXVI.—HOW TO HAVE PURE AIR

ENOUGH fresh air for one person comes into a room through the cracks around the windows and doors. A lamp, when burning, uses up as much fresh air as three persons. There is hardly a night in the whole year when it is not best to sleep with a window open an inch or two.

Persons who take cold quickly are unwise to sit near windows in church or school, for even if they close them, they shut off the fresh air from others. This is not right. Such persons should remember to sit in the part of the room farthest from the windows.

If a closed room is crowded with people, they soon use up all the good air, and fill the room with impure air from their lungs. How much better one feels after he goes from such a room out of doors! There is nothing like bad air to make all the pupils in a school restless and idle. There is



FIG. 29. — A SCHOOLROOM WITH IMPURE AIR.

A schoolroom like the one shown in the picture cannot be ventilated properly because the stove is by the wall away from the windows. If a window is opened the cold air will reach the pupils before it gets to the stove. After the air has been warmed by the stove it will go out at the tops of the windows and doors. To keep the room warm the windows have been closed tight and the pupils cannot study well.

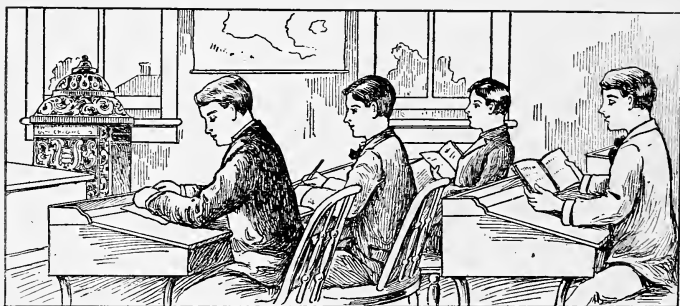


FIG. 30. — A SCHOOLROOM WITH PURE AIR.

The careful teacher has had the stove moved to a window and has raised the window a little. As the cold air comes in it will be warmed by the stove. The air is thus kept warm and pure and the pupils feel like studying.

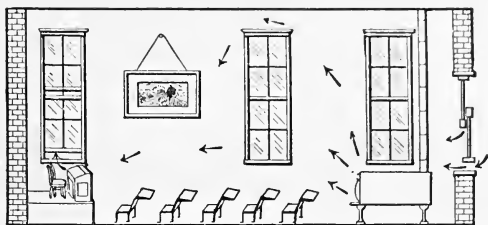


FIG. 31.—A SCHOOLROOM WITH AIR THAT IS BOTH WARM
AND PURE.

The arrows show how the air moves. Does the impure air go out near the stove or far from it?

nothing like fresh, pure air to help pupils to study, and to learn quickly.

If we stay in a closed room, after awhile we become dull and stupid. If we stay in such a room many times we may become ill.

THE DOCTOR'S STORY

1. Mrs. Rogers lay in her bed,
Bandaged and blistered from foot to
head,
Bandaged and blistered from head to
toe,
Mrs. Rogers was very low.
Bottle and saucer, spoon and cup,
On the table stood bravely up;

Physic of high and low degree,
Calomel, catnip, bone-set tea —
Everything a body could bear,
Excepting light and water and air.

2. I opened the blinds ; the day was bright,
And God gave Mrs. Rogers some light.
I opened the window ; the day was fair,
And God gave Mrs. Rogers some air.
Bottles and blisters, powders and pills,
Catnip, bone-set, sirup, and squills,
Drugs and medicines, high and low,
I threw them as far as I could throw.
“What are you doing?” my patient
cried ;
“Frightening Death,” I coolly replied.
3. Deacon Rogers he came to me ;
“Wife’s comin’ round,” said he.
“I really think she’ll worry through ;
She scolds me just as she used to do.
All the people have poohed and
slurred —
And the neighbors have had their word ;
’Twas better to perish, some of ’em
say,

Than be cured in such an irregular way."

"Your wife," said I, "had God's good care,

And his good remedies, — light, water, and air.

All the doctors, beyond a doubt
Couldn't have cured Mrs. Rogers without."

4. The deacon smiled and bowed his head;
"Then your bill is nothing," he said,
"God's be the glory, as you say.
God bless you, doctor; good day! good day!"

* * * * *

If ever I doctor that woman again,
She'll get some medicine made by men!

—WILL CARLETON.

From "Farm Legends," copyright, 1876 and 1904, by Harper & Brothers.



XXXVII.—REVIEW

WHAT is the windpipe? How do the chest walls move to cause the breath to come in? To cause it to go out? How does food sometimes get into the windpipe? What must sometimes be done to get it out? Why do we breathe? How do clothes keep us warm?

Tell the story of the untidy housekeeper.

What harm is caused by dust? Tell how a room should be swept to get rid of the dust. What two things should we have in mind when ventilating a room? Give hints for avoiding colds.

Do sick people have a greater or less need for pure air than well people? Tell about the sick soldier. Tell what you have learned about ventilation.

Tell how the sick woman in "The Doctor's Story" was being treated unwisely.

Could we live longest without food or water or air?

XXXVIII.—HOW TO STRENGTHEN THE LUNGS

THE best way to make the lungs grow large and strong is always to sit and stand



Throwing the shoulders back is not all that is required.



The chest must be thrown forward, the chin drawn in.

FIG. 32.

and walk with the chest forward and upward.

Tight clothes around the waist press the

stomach and liver down and out of place, and bind the ribs down. In this way the chest wall is kept from rising. Tight clothes cause flat chests. They make the muscles of the trunk so weak that they can hardly hold the body erect. If you

become stoop-shouldered, you cannot have full-sized lungs. It is not graceful to have a hump on the back that reminds one of a camel.

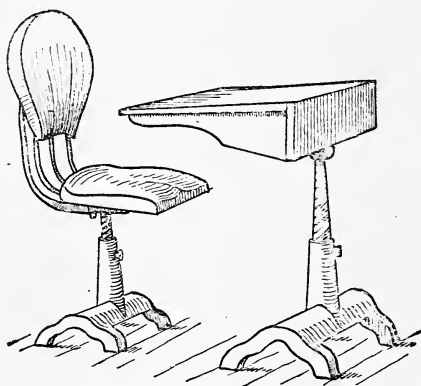


FIG. 33.—ADJUSTABLE DESK.

It is also very important to run or to do some work each day that will make you feel a little short of breath, and cause you to take deep breaths. But never tire yourself out, for this is not best for you.

If you sleep in pure air, you will not feel tired when you get up, but you will be rosy and rested and ready for work or play.

Always breathe through the nose.

Cigarettes are worse for the lungs than cigars, pipes, or alcohol. A boy that smokes cigarettes for a long time usually has a flat chest. He cannot run very far without getting out of breath.

One would think that a big cigar and a strong pipe are worse for the lungs than small weak cigarettes; but this is not true. Cigarettes do far greater harm. Did you ever see a man smoke a pipe and blow the smoke out of his nose? Certainly not, but cigarette smokers often do this. Where had the smoke been before it came out of the nose? It had been in the lungs. The smoke of a cigar or a pipe is too strong to be inhaled. The lungs are many times larger than the mouth, and the lining of the lungs is much thinner than the lining of the mouth. Through this large, thin lining, the poison of the cigarette smoke passes much faster into the blood than the poison in cigar smoke can pass to the blood through the smaller and thicker lining of the mouth. Here you have the two reasons why cigarettes break down the health of people more quickly than either pipes or cigars.

THE HAUNTED HOUSE



1. Several miles from the town of N—— was a large house, the home of a rich farmer. It stood some distance back from the road, in the midst of a grove. This man's family were not healthy; the children were weak, not sound and strong as farmers' children usually are. The eldest, a gentle girl, became sick and died.

2. The farmer soon moved to another place and rented his beautiful home to a stranger. This man also had much sickness in his family, and two of his children died. The house was rented to others, but misfortune came, and they too moved.

3. Then the more ignorant people of the community said the house was unlucky, and some said that it was haunted. No one would rent it. The boys of the neighborhood said that lights moved about

in the house at night, and that a figure dressed in white appeared at the windows. They said it was a ghost and that the house was haunted by an evil spirit. Travelers always passed quickly by the haunted house at night.

4. The house was offered for sale at a low price, and a man bought it for almost nothing. Before his family moved in, he drained a stagnant pond. He cut down a tree that overhung the roof and kept one wall of the house damp; the leaves from this tree had fallen into the gutters and had been carried into the cistern. The new owner cleaned out the gutters and the cistern. He laid a pipe to drain a low place in the yard. The outhouses and the cow pen and pig pen were near the well; he moved them all. He burned up piles of trash and old carpets.

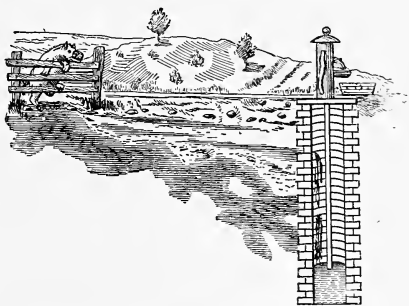


FIG. 34.—DANGEROUS NEIGHBORS.

5. It was an old house, and he found that whenever new paper had been put on the walls, it had been pasted over the old paper. So he tore off all the paper and cleaned the walls before putting new paper on them.

6. His family all had good health. The neighbors saw no lights in the house after bedtime, and they saw nothing like ghosts at the windows, except the reflection of the moonlight on the window panes.





XXXIX.—THE HEART AND THE BLOOD

YOU may have broken the stem of a plant called the milkweed. If so, you noticed a thick, white juice come out of the stem. This juice has in it the food which makes the plant grow. If you cut your finger, the red blood runs out in drops, or in a stream if the cut is large and deep. The blood contains the food which makes the body grow and keeps it well. The blood is made from the water we drink, the food we eat, and the air we breathe. If plenty of fresh air is taken into the blood through the lungs, the blood is bright red. If not, the blood is of a bluish red color.

You may have noticed that people are usually pale or dark when they are in poor health. Their blood is not so red as it should be. Perhaps they have not been able to digest enough food, and have not drunk enough pure water; hence they have

not enough pure blood in their bodies to make their cheeks red.

A microscope is made of a glass lens or of several lenses. The microscope makes things look many times larger than they

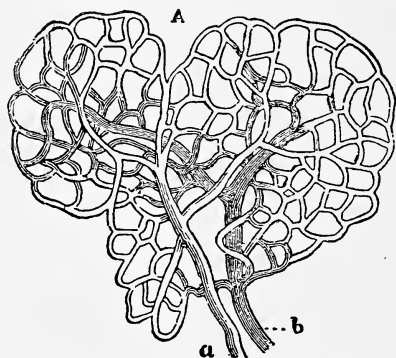


FIG. 35.—AN ARTERY; (*a*) VEINS, AND (*b*) THE CAPILLARIES THAT CONNECT THEM.

are. If we put a drop of blood under the microscope, we shall see that the blood is a clear fluid in which a great number of little bodies, called

cells, float. (See

Fig. 7, on page 45.) The blood looks red, just as a glass of water would look red if we should drop into it a great many very small red beads.

The cells are so tiny that there are one million of them in a small drop of blood. When we breathe air into our lungs, the pure, fresh, strengthening part of the air soaks into these little blood cells, and these

faithful little carriers take it to all parts of the body. They do not stop with carrying good things to the right places, but they take back to the lungs all of the impurities they can carry. This is why the air that we breathe out is impure.

The food is carried in the watery part of the blood. In some wonderful way which no man can explain, the food particles are taken out of the blood stream just where they are needed by the body and made into new muscle and bone and skin.

The blood is never still; the heart keeps it always moving. The heart is a hollow muscle. (See its picture on page 45.) When it is full, it has the power of making itself smaller, and so it squeezes the blood into a large tube. This tube soon divides into smaller ones. A tube that takes the blood *from* the heart is called an *artery*. The blood goes back *to* the heart through other tubes called *veins*.

Before the blood goes back to the heart, it must pass from the arteries to the veins through tiny tubes called cap'illaries. Each capillary is finer than the finest hair, and

can be seen only through a microscope. The capillaries shown in Fig. 35 join an artery to veins. They are shown as they appear under a microscope.

The heart is divided into the right and left sides by a wall of muscle. The dark, impure blood goes through the right side of the heart to the lungs; the bright, pure blood from the lungs goes through the left side of the heart to the body again. The blood thus goes through the same tubes over and over again, and is said to *circulate*.

THE FOUR SCHOOLMATES

1. Four children walked to school along the same street. Not one of them was really clean, and this is the reason why.

The first pupil lived a long way off in the suburbs, and came along a muddy road. His shoes and his clothes were spattered with mud.

The second pupil did not like to brush his hair, to clean his finger nails, or to take a bath. Sometimes he did not take a bath

even on Saturday night if his mother did not remind him. So his skin was not clean.

2. The third pupil was so fond of eating that he might almost be called a glutton. He was always ready to eat between meals, and if there was anything especially good on the table, he almost stuffed himself. He made his stomach weak, and often when he ate a great deal, the food would not be promptly digested. The result was a bad odor which could be smelled on his breath. His teeth were not kept clean, and some of them were decayed and helped to make his breath bad. Therefore the third pupil was not clean because his digestive organs were not clean.

3. The fourth pupil lived in a home of very ignorant people. Her parents did not know what pure air is for. If the weather was the least cold, they would shut every window tight and sleep all night in rooms thus closed. They kept the house closed during the day and breathed each other's breath over and over again. This pupil was fourteen years old, and she had a foolish idea of trying to look like a young lady.

So she had begun to wear tight bands and belts around her waist, and she could not draw a deep breath even when she was out of doors in the pure air. So her blood became impure, and pimples came out on her face. Because of impure blood, she often had bad colds, which inflamed her nose and caused catarrh. This made her breath almost as bad as the breath of the third child, which was bad enough, as any one that got a whiff of it would say.

4. There were many children in school with clean clothes and nails and hair, with clean skins, clean stomachs, and clean blood. But there remains the puzzling question: Which one of the four schoolmates mentioned was the cleanest of all? Which one was the least clean of all, the one with unclean clothes, or skin, or stomach, or blood? What is your opinion?

XL.—WHY THE BLOOD MUST KEEP MOVING



WHERE does the heart send the bright, pure blood? Where does it send the dark, impure blood? What are the lungs for? The red blood cells take up a part of the pure air in the lungs and then go floating off in the blood to all parts of the body.

What a wonderful, busy machine the heart is, beating away, thousands of times each day all through life, and stopping to rest only for an instant between each beat!

We must be careful not to make the heart beat too fast by violent exercise. It is foolish for girls to jump the rope and for boys to run until the heart beats painfully. The hearts of many boys who smoke cigarettes do not beat regularly. Smokers may have what is called "tobacco heart"

or "trotting heart." The heart beats fast for a while and then goes very slowly for a while, like a horse that trots for a time, then walks, and then trots again. Sharp pains in the left side may tell smokers of the harm that is being done.

Did you ever place your finger on the thumb side of the wrist and feel the pulse? Let us find out how the pulse is caused. If you should fasten a rubber hose to the mouth of a common pump, you would see that every time you pressed down the handle of the pump, water would come out of the hose in a jet. If, at the same time, you were to press your finger on the rubber pipe, you could feel the pipe swell a little as the water passed through. In the same way, every time the heart beats, or throbs, the arteries swell a little. This swelling is what we feel as the pulse in the wrist or temple or neck.

Tight collars, tight belts, and tight shoes injure us, for the heart has to work harder all day long to force the blood through the tubes that are pressed upon by the tight clothes. Tight clothes cause a tired

feeling, headaches, cold hands and feet, and other ills which could be prevented if people would only have more regard for their hearts. Many silly young women wear tight clothing that pinches their waists.

Any one who has a good free circulation is likely to be well, for the blood removes all impurities and keeps the body pure. You learned that the food is digested in the food canal. All parts of the body must have some of the food. The head needs its share, the legs need their share, even the fingers and toes must have part. The blood takes to each of them just the kind of food that part needs, and so keeps it sound and well. If you were to tie a cord tightly around your arm near the shoulder, the arm would soon begin to grow cold. It would seem heavy, and soon the feeling in it would be lost. This is because the tight cord stops the blood in the arm from moving. A finger will become dark, if a string is tied around it; this is due to the fact that the blood in the finger becomes impure, because it cannot return to the lungs.

THE CALF THAT KNOCKED DOWN A TREE

1. A great oak tree with spreading branches grew in the edge of the forest near a town. A man came and built his home near it. When he plowed the garden, many of the roots of the tree were cut by the plow. The fence was nailed to the tree. The man's son had a hatchet, and he hacked the tree with it. The end of the clothesline was looped around the tree, and as the tree grew, the wire cut into the bark. The tree finally became weak and tottering. One day when the wind was blowing, a calf rubbed against the tree, and down it fell. As the tree fell, the man said: "That horrid calf! It has ruined my great tree!"

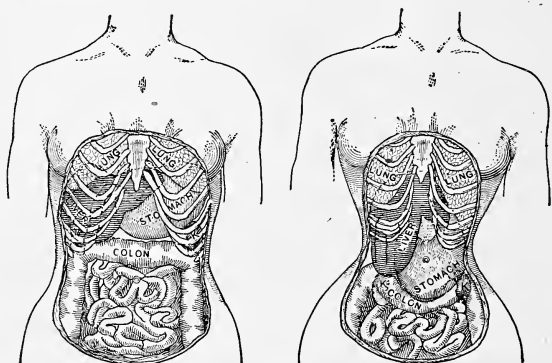
2. There was a man who was so anxious to make money that he stayed in his office all the time. His muscles became weak. He loved to eat, so he ate as much as when he was a farmer boy, and his stomach became weak. He dressed in very thick clothing, and kept the rooms closed and

very warm, so his nerves and blood tubes became weak. One day he sat by an open window. A gentle draft of air came in that was pleasant and strengthening to all others in the room. But this man took cold, and soon had consumption and died. So some people said: "Fresh air is a very dangerous thing. It killed this man."

3. A girl was growing up hearty and strong. She could run and romp and shout like any boy. But she saw that older girls did not dress as she did and concluded that she must be like them, or she would never be a "sure enough" young lady. So she persuaded her mother to make her skirt separate from the waist of the dress, and she tied the skirts tight around her waist, so they would not slip down. Of course she could not take a deep breath, and her poor liver and stomach had a hard time to grow. Her blood could not flow so well. She could not run and jump and shout as well as before.

When she grew to be a young lady her cheeks were pale, and she did not have a good appetite. She had headaches. The

weight of the skirts pressed the inner parts, or organs, out of place. The walls of her waist became flabby and weak. One day she jumped out of a carriage, and the jar injured her greatly because her organs were already pushed out of place. She



The organs in a natural waist. The organs in a deformed waist.

FIG. 36.

never saw a well day after that. She was very sickly, but a man was foolish enough to marry her. She was so weak and nervous, and her temper was so quick, that she made his life miserable. She said: "How foolish it was to jump that day! It has ruined my health." Yet other girls who always dressed sensibly could run and jump without danger of hurting themselves.

XLI. — REVIEW

WHAT is the best way to help the lungs to grow large and strong? How may the lungs be injured? What kind of exercise helps the lungs most? Give two reasons why cigarettes are worse for the lungs than cigars or pipes. Does more smoke get into the lungs of one who smokes in the house or of one who smokes out of doors? Will the lungs of the first smoker be damaged more? Does such a smoker injure the health of other people?

In the story of "The Haunted House," what six ways are mentioned in which a home may be unhealthful? How may it be made healthful?

Of what is blood made? How does the blood look under a microscope? What do the blood cells carry? Of what is the heart made? What is an artery? A vein? A capillary?

Tell why each of the children in the

story of "The Four Schoolmates" was not clean.

What kind of play is sometimes bad for the heart? Describe the beating of the "tobacco heart."

How does the heart cause the pulse? How may the circulation of the blood be hindered? Why is one with a strong circulation likely to be well?

In the story, "The Calf that Knocked Down the Tree," what really gave the man the cold? What caused the girl to lose her health?



THE SINGERS

XLII.—THE COVERING OF THE BODY

HAVE you ever noticed, when whittling a twig or cutting through the bark on a stick of firewood, that a tree really has two barks? It has an inner bark that fits tight to the wood, and an outer bark, which, in old trees, is thick and rough. Much of the outer bark can be cut off without injuring the tree, but if you cut off any of the inner bark, you are likely to do the tree great harm. The sap of the tree may flow, and a scar will be left. The covering of our bodies is something like that of trees; although we do not have two skins, we have one skin with two layers.

The outer layer has no blood tubes or nerves. You can run a pin through this layer without causing pain or making it bleed. How fortunate is this! If the blood tubes and nerves came into the outer layer, every little bruise and scratch would be very painful, and cause the blood to

flow. The inner layer has many blood tubes and veins. After a person has worn his skin a long time, perhaps for fifty years,

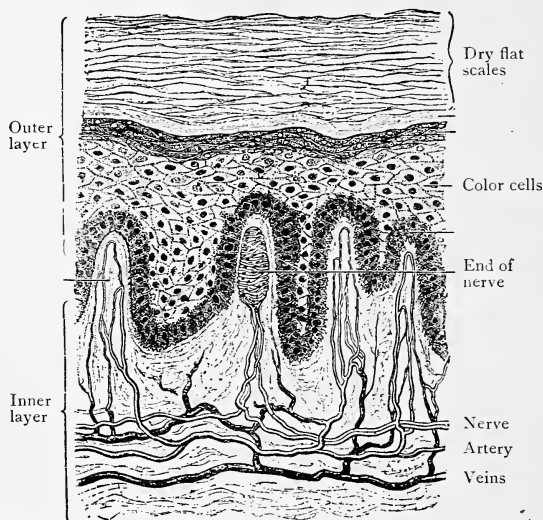


FIG. 37.—A SLICE OF THE SKIN AS IT LOOKS UNDER THE MICROSCOPE.

it does not fit so well as when he was young; he shrinks away from the skin, and it wrinkles.

We shed the skin little by little in fine powdery scales. These scales are not usually seen, but if you take a garment that has been worn next the skin, and shake it in the sunlight, you can see the scales

falling like dust. The skin is constantly rubbing against the clothing and other things, and is always being worn off. But it never wears out, for the blood is ever bringing it food, thus keeping it in repair.

Our skins are made rosy by the blood that is in the inner layer, and they are made dark by little bits of coloring matter, called pigment, in the outer skin. When the pigment is in patches, it makes freckles.

Using the muscles makes the skin smooth and rosy and beautiful by sending fresh blood to the skin and by making the skin perspire freely. Some like to use the muscles in playing games and others like to train themselves by exercise; but the best and healthiest way of all is by doing useful work. One who uses his mind only and lets his body become weak is only half a man. Only foolish people are ashamed of working with their hands. No one should be ashamed of work except the one who does not do his work well. We should be ashamed to be stupid workers and work with the hands only, for the good workman uses his mind as he works.

XLIII.—USES OF THE PARTS OF THE SKIN

THE hair grows from little pockets, or pits, which reach deep down into the skin. In the skin of birds, these pockets are larger, and, instead of hairs, feathers grow from them. Near the roots of the hair are many little oil glands. They furnish oil that keeps the skin soft and the hair glossy. Other kinds of hair oil do not do the hair any good. Hair dyes are often poisonous, and should not be used. The hairs on the nose are very small, but the pits from which they grow are large. The pits become still larger when they are filled with oil and dirt.

The nails grow out from deep grooves in the skin. The nails aid in picking up very small objects, and keep the ends of the fingers from being hurt. It is well that this is so, for there are many delicate nerves in the ends of the fingers. The nails grow in length about as much each

week as the width of the letter "n" on this page. If you will keep the skin pressed back at the roots of the nails, you will not have loose bits of skin called "hangnails." These should be snipped off with the scissors, not bitten off. If you press the skin back too far, the nails will grow with white specks or flaws in them. The nails are not poisonous, but sometimes there is poison in the dirt under them. Clean nails are one sign of a careful boy or girl.

Did you know there are so many things in the skin? There are nerves, pockets for hair, blood tubes, oil glands, nails.

One more thing should be mentioned. There are millions of sweat glands. These are tiny tubes with their lower ends coiled like balls of twine. The openings in their outer ends are called pores.



FIG. 38. — THIRTY
SWEAT GLANDS.
NATURAL SIZE.

The perspiration, or sweat, passes up through the long, narrow tubes to the outside of the skin and is given off all the time. Sometimes it forms drops which we can see. If you wish to prove whether or not perspiration is leaving the skin all the time,

take a piece of cold glass and hold it against the skin of your hand. The glass will soon be covered with moisture.

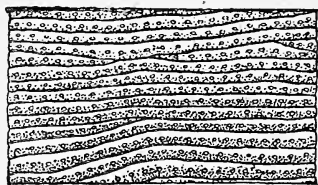


FIG. 39. — PORES, OR OPENINGS OF SWEAT GLANDS, SEEN WITH A MAGNIFYING GLASS.

Perspiration has two uses: it takes heat away from the body, and it takes waste matter or impurities away from

the body. A tobacco user, who works hard in the open and perspires a great deal, rids his body of a part of the poison in tobacco, and his health is not injured so much by the use of tobacco as the health of a man who works indoors and perspires very little.

The lungs aid the skin in keeping the body clean; but the greatest help to the skin in taking away waste matter is the kidneys. These are two bean-shaped bodies lying behind the stomach, close to the backbone. They contain many tiny tubes like the sweat tubes in the skin. They take away a great deal of water at the same time to help wash away the waste matter.

Why does it not hurt to cut the hair?
Why does it hurt to pull the hair?

Here are two good rules: *Keep the feet dry and warm. Never sit in a cold draft when you are heated.* It is when one is perspiring that drafts do harm. People who do not observe these simple rules deserve to have bad colds and to suffer. They are usually punished for their neglect.

Too great cold or dampness may cause the pores of the skin to become closed. Then the lungs and kidneys have to do the work of the skin. Colds, coughs, or headaches may result. These tell us plainly that the blood is not being properly purified. Sometimes one has a cold when the skin is all right and the body has not been chilled. This means that impurities have gotten into the blood from breathing bad air or eating too much. The cold is only removing the impurities and making the blood pure again.



A GIRL'S SECRET

1. A young lady was noted as being the most beautiful woman in the city in which she lived. There were other women with eyes as beautiful, and with faces as perfect in shape, but none of them had so perfect a complexion as she. Once when she was talking with a number of friends, they asked her why her skin was so perfect. In reply, she told them the following story:—

2. "When I was a young girl I went to stay all night with a little friend of mine. This girl had an older sister who had gone to a party that night, so we amused ourselves by playing party, too. We dressed up in the young lady's long dresses, crimped our hair, and put powder on our faces. We thought we looked very fine. When I went home the next morning, my mother saw some of the white powder around my eyes, where I had not washed it off.

3. "Now my mother had noticed that some other girls, who knew no better, had made their skins dry and dark and dingy by the use of powder, and she had told me

never to put powder on my face. When she saw how I had disobeyed her, she punished me severely, hoping to keep me from ruining my skin. I remembered the lesson, and never again made my face dirty and dry with powder."

4. So this girl's skin kept fresh and smooth and rosy as she grew up. When she was a young lady, her skin was as fresh as a child's, and she became a noted beauty. Thus her friends learned the secret of her beautiful skin.



XLIV.—THE CARE OF THE SKIN

A COOL bath in the morning causes the blood to flow faster and the skin to glow, and makes one feel better all through the day. Some people bathe in clear water once a day, and bathe with soap and water once a week. It is very little trouble to bathe every morning after you once get into the habit of doing so; instead of trouble, bathing becomes a great pleasure.

If you do not wear clothing that is too heavy, and if you often take cold baths, you are not nearly so apt to catch cold. It is a great deal better and easier to prevent taking a cold than to cure one, as any person knows who has tried both ways. Those who do not wash the skin often enough sometimes have an unpleasant odor.

Do not go bathing in a river or the sea when you are very tired and warm, but wait a little until you are rested and cool. People have had cramps and have been drowned

for failure to remember this. Neither should you bathe just after a full meal. It is the duty of every person to learn to swim.



FIG. 40. — SISTER'S SWIMMING LESSON.

Many lives have been saved by swimming. Learning to swim is easier for children than for grown people. It is best not to stay in the water longer than ten min-



A STORY WITH-
OUT WORDS.

utes if the water is cool. Foolish people sometimes stay in the water until they shiver and their teeth chatter. Thus they bring on serious illness or injure their lungs or nerves for life.

When clothes are taken off at night, they should be spread out so that they will be aired by morning. It is not a healthful habit to roll up your night dress in the morning and put it under the pillow. Outer garments that cannot be washed should be sunned. Rubber shoes do not let the perspiration pass off; so you should remove them as soon as you come off the wet ground.

Who would not like to have a clear, smooth skin! If you eat as you should and digest the food well, your skin will not have much waste matter

to give off. Your mind will also be brighter. People who are greedy about eating, who take little exercise, who do not keep the face clean, or who live in hot rooms, cannot have fair skins and beautiful complexions.

Clean people keep not only their bodies clean, but their houses and yards clean also. They do not place drains or stables too near wells. Slops should not be thrown near wells. If a person has typhoid fever or cholera or other "catching disease," the water draining through the ground into the well may carry the disease, and those who drink the water from the well may take the disease. People ill with coughs should use paper spittoons, so that the spittoons may be burned.

XLV.—THE CIGARETTE HABIT

THE following is a recent report of the principal of one of the Chicago schools:—

“In the last three years, in my school, I have found 125 boys who smoked from two to twenty cigarettes a day, and not more than ten of them were able to keep up with their class.

“Among these 125 boys were found nearly all those pupils who were from two to five years older than the average age of children of the same grade, as well as nine tenths of those boys who were hard to get along with, and all of those who were in the habit of playing truant.

“An Anti-tobacco Society was organized, which most of the boys joined. From frank and friendly talks with them many of their temptations were made clear. Twenty-four stated that the reason they failed to learn their lessons was because most of the time they were too sleepy to study; thirty said they were always dizzy after smoking,

and did not feel like thinking; twenty-two could not write neatly because their hands trembled; several, to use their own words, felt shaky when they walked.

“A large number of these boys were unable to run any distance, some not more than a block, although before they began to smoke they could run as far as any one. Nearly all told me they had headaches. With scarcely an exception, they stated that they were unable to learn their lessons, though kept after school hours for that purpose.

“It is safe to say that there are 5000 cigarette smokers in the Chicago schools, not more than 400 of whom are able to advance with their class.”

LAZY PEOPLE HAVE THE HARDEST WORK TO DO

1. A boy came in when the supper bell rang and threw his hat into a corner. The next morning when he wanted to go to school, he had to look for ten minutes to find his hat. His brother hung his hat in the right place, and had no trouble.

2. A girl was too lazy to wash her teeth, although her mother bought her a tooth-brush. She was not too lazy to go to the dentist a few years later, every day for a whole week, until he filled her teeth; for she could not sleep at night because of the toothache.

3. A farmer was too lazy to mend a broken fence. Cows got into the field and ruined half his corn. He raised only half as much corn with the same work as a farmer across the road who was not too lazy to take care of his fence.

4. A lady got her feet wet on a rainy day. She was too careless to put on dry shoes and stockings when she got home. A bad cold that lasted a week gave her a hundred times more trouble than the trouble of changing her shoes and stockings. A girl that always hung her scissors on the same peg had no trouble to get them. Another girl who did not do this, was always looking for her scissors.

5. A plowboy always left his plow in the field where he happened to quit work. The plow rusted and its handles rotted.

He had to work still harder to pay for twice as many plows as he would have needed if he had not been so lazy.

6. A boy was too lazy to hold up his head and chest. He grew to be a flat-chested man, and was always tired because he could not breathe well.

7. Another boy used to read stories late in the evening. When the sun went down, he would not take the trouble to stop to light a lamp. His eyes became so weak that he could read hardly at all, and he had weak eyes all his life.

8. The teacher and pupils of a school were too lazy to ventilate the room. They breathed the foul air over and over again and their poor brains did not get fresh air. So the pupils' minds were dull, and it was hard for them to study. They felt restless, and the teacher had twice the trouble to keep them quiet that she would have had if they had been comfortable.

9. A woman was too lazy to cook well. She was too careless to keep the fire just right, to put things on the stove at the right time, and to take them off at the right

time. Much of the food was thrown away, because it was so poorly cooked. There was much sickness in the family from indigestion, and the woman and her husband had to strive hard to pay the doctor and the grocer.

10. A man who had one cord of wood to cut was sharpening his ax. Another man who had ten cords of wood to cut came by. His ax was dull, too. He said: "You have just a little wood to cut, and yet you have time to sharpen your ax. I haven't time to sharpen mine." A student who had many lessons to study thought he did not have time to exercise. He was much longer learning his lessons than a student who worked and played in the open air for two hours each day and sent plenty of pure blood to his brain to sharpen his wits.



XLVI. — REVIEW

WHAT have you learned about the outer layer of the skin? About the inner layer? Why does not the skin wear out? What are freckles? From what does the hair grow? What is the use of the oil made by the oil glands? What is the use of the nails? About how fast do they grow? What should be done with “hangnails”?

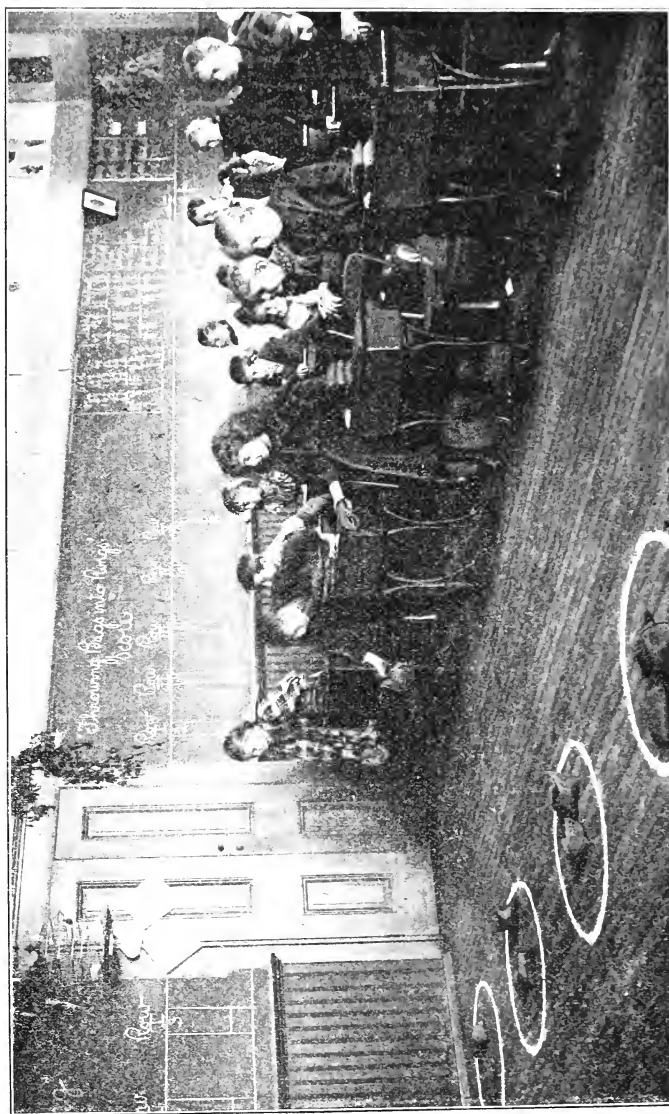
What is the form of a sweat gland? What is a pore? How can you prove that perspiration is being given off all the time? What are the two uses of perspiration? Men who work in what way are injured least by the use of tobacco? In what ways are the lungs and the kidneys like the skin? What are the kidneys? What is a good rule about the feet? When are drafts harmful? What do colds tell about the condition of the body? Name the other causes of colds besides chilling the body.

What was the cause of the beautiful complexion of the young lady in the story?

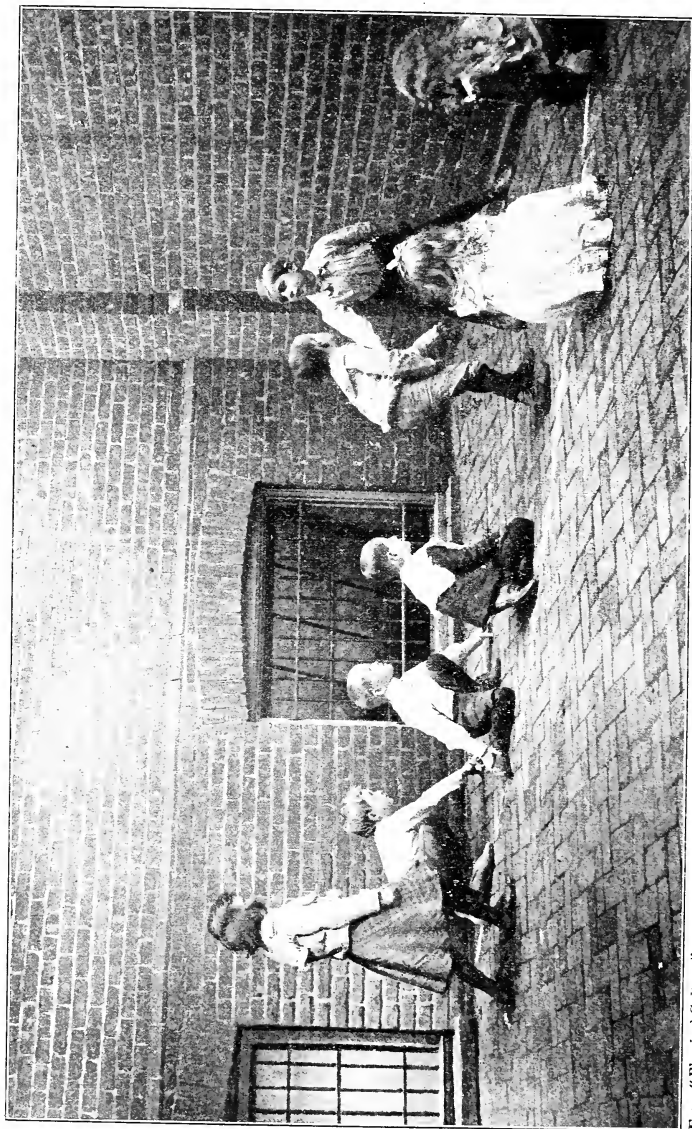
What is said about bathing? Repeat what is said about swimming. How may rubber shoes injure the health? Tell several things that help to make the skin clear and smooth. Repeat the hints for cleanliness of the home.

Of the one hundred and twenty-five cigarette smokers in the Chicago school, how many were able to keep up with their classes? How did smoking affect their dispositions; their regularity at school? What six bad effects did these boys say they felt from smoking cigarettes?

Show how laziness or carelessness may cause trouble with the teeth; with the chest; with the eyes; with the digestion of food; with reading and studying. How may it lead to trouble from bad colds? To trouble in school?



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FIG. 42. — PLAYING KLONDIKE (see page 186).

APPENDIX

TESTING THE SENSES

MANY little boys and girls are partially deaf and do not know it. The teacher may think them dull or careless, when the only trouble is, they cannot hear well. They should be given front seats. The teacher may test you with the ticking of a watch. The ticking of some watches can be heard across the room by good ears, while persons with weak hearing cannot hear it a few feet. You should test each ear by itself.

The teacher may test whether you are color-blind by holding up bits of colored yarn or other things. Some persons cannot tell green from red. They should never expect to be dry-goods merchants or railroad men; on a railroad a red light or a red flag is a sign of danger.

You must test each eye by itself with the large letters below:—

V B S H O K N E D A

Can you read these letters at the distance of ten feet?

Z P L R D F

Can you read these letters at the distance of twenty feet?

EXERCISE AND OUTDOOR GAMES

Formal exercise for young children, carried to any considerable length, is somewhat trying on the nervous system. Games are better than formal exercise.

Children in some communities and in some schools do not seem to possess a variety of games. The teacher should aid the children, but should withdraw aid as soon as the games have been learned. Several new games and a number of old ones are mentioned below.

Klondike (Fig. 42). — A white mark is drawn for a boundary line, the space within which represents Tom Tiddler's claim for a gold mine. The other children imitate the act of picking up something from the ground, repeating, "Here I am in Klondike land picking up nuggets of gold." Tom is not allowed to pass beyond his own boundary line. If he succeeds in catching one of the miners inside the line, that miner must take Tom's place, while Tom joins the ranks of the other miners.

In **Jumping the Rope**, a row of the children should be formed, and each child should jump the rope in turn while two children are swinging it. This gives pleasurable exercise without the danger of overdoing it.

Other healthful games are Leap Frog, Anthony Over, Roly-holey, Hide and Seek, Hide the Switch, Prisoners' Base, Fox and Geese, Drop the Handkerchief, etc.

London Bridge (Fig. 43). — Two players represent the bridge by raising their arms so as to form an arch. When the words "My fair lady" are sung, the two keepers of the bridge let their arms fall, catching whichever child happens to be passing under at the time. He then is asked, "Do you choose gold or silver?" The keepers have privately agreed which one of the sides each word shall represent, and the prisoner will be allotted to one side or

the other according to his choice. When all have been caught, the game ends with a "tug of war" between the two sides. *Song.* "London bridge is falling down, Falling down, Falling down, London bridge is falling down, My fair lady." By like repetition, the other verses are formed out of the following lines, each verse ending, "My fair lady." "Build it up with iron bars"; "Iron bars will bend and break"; "Build it up with silver and gold"; "Silver and gold will be stolen away"; "Get



FIG. 43.—LONDON BRIDGE IS FALLING DOWN.

a man to watch all night"; "Suppose the man should fall asleep"; "Get a dog to bark all night"; "Suppose the dog should meet a bone"; "Get a cock to crow all night."

Round and round the Village.—The children form a circle with one player standing outside. The children of the circle stand still, and at the first verse the child dances around outside the circle. At the second verse the children in the ring raise their hands, allowing the one outside to pass under. She runs in under one pair of arms and out under another, and so winds in and out

until she has passed around the ring. She completes the circle by the time the verse is sung. At the third verse she stops in the center of the ring, and chooses one for her partner, and they stand facing each other until the last verse, when they bow and part. The first child then takes her place in the circle, and the game is continued by the second child. *Song.* "Round and round the village, Round and round the village, Round and round the village, As fast as we can go." Other verses: "In and out the windows," etc.; "Stand and face your partner," etc.; "And bow before you go."

Here We go round the Mulberry Bush.—The game consists in simply suiting the actions to the words of the song, singing and circling to the first verse after each of the other verses. *Song.* "Here we go round the mulberry bush, The mulberry bush, the mulberry bush, Here we go round the mulberry bush, So early in the morning." Other verses are: "This is the way we wash our clothes," etc.; "This is the way we iron our clothes," etc.; "This is the way we scrub the floor," etc.; "This is the way we mend our clothes," etc.; "This is the way we sweep the house," etc.; "This is the way we bake our bread," etc.; "This is the way we go to church," etc.

Oats, Peas, Beans, and Barley Grow.—Children dance in a circle with one in the center who personates the farmer. All the circle imitate action, which may be varied. The child chosen remains in the ring, and during the singing of "Waiting for a partner," etc., chooses another child for a partner. They stand together while circle repeats chorus. Child last chosen remains in circle and game is repeated. *Song.* "Oats, peas, beans, and barley grow; Oats, peas, beans, and barley grow. Can you or I or any one know How oats, peas, beans, and barley grow? Thus the farmer sows his seed, Thus he stands and

takes his ease, Stamps his foot and claps his hands,
And turns around and views the land. Waiting for a
partner, Waiting for a partner; Open the ring and
choose one in, While we all gayly dance and sing."

Jolly is the Miller. — Form a double circle, children
marching with linked arms around the miller, who
stands in the center. Children change partners at the
words "right steps forward, and the left steps back."
The miller then has a chance to get a partner. The
child left without a partner becomes the miller. *Song.*
"Jolly is the miller who lives by the mill; The wheel
goes round with a right good will; One hand in the
hopper and the other in the sack, The right steps for-
ward, and the left steps back."

Bean Bags (Fig. 41) may be used in numerous games.
Pupils form a circle and toss a bean bag (or a knotted
towel) to and fro until one in the middle catches it and
takes the place of the one that tossed it last. Pupils
form in two rows and each row tries to pass a bag down
the row and back again more quickly than the other.





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